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THE UNIVERSITY OF ALBERTA  
EVALUATION OF PARTIALLY INTEGRATED CLASSES  
FOR LOW-ACHIEVERS

by



Eugene Dobransky

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES  
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THE UNIVERSITY OF ALBERTA  
FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read,  
and recommend to the Faculty of Graduate Studies  
for acceptance, a thesis entitled "Evaluation of  
Partially Integrated Classes for Low-Achievers,"  
submitted by Eugene Dobransky in partial fulfilment  
of the requirements for the degree of Master of  
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THE UNIVERSITY OF ALABAMA  
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submitted by Eugene Johnson in partial fulfillment  
of the requirements for the degree of Master of  
Education.



## Abstract

The purpose of this study was to compare two types of classroom grouping for low-achievers who completed elementary school but who appeared unable to cope with a regular junior high school program on a full time basis. One group of low-achievers attended specially segregated classes full time (control group) and a second group of low achievers were partially integrated into the regular grade seven program of studies (experimental group). The two groups were compared for gains in academic achievement as measured by the Stanford Intermediate Achievement Test II Partial Battery (SAT).

To make a comparative study of the achievement of the pupils in the experimental and control groups each of the null hypotheses was tested twice--once after five months the study was in progress and secondly after ten months the study was in progress or at the termination of the study. Since there were differences between the group mean scores (significant in the language test) in favor of the experimental group and since it was desirable to remove this initial bias statistically the null hypothesis was tested by carrying out a one-way analysis of covariance. Thus, a one way analysis of covariance was employed comparing the September to January achievement test results and a second one way analysis of covariance was done comparing the September





to June achievement test results.

In addition a correlated t-test was employed to determine whether significant achievement gains had been made by both groups at the end of the experimental period.

The findings of this study may be summarized as follows:

- (1) After five months the study was in progress there were significant differences in favor of the experimental group on all variables of the SAT except Arithmetic Computations.
- (2) After ten months the study was in progress there were significant differences in favor the experimental group in the Word Meaning test, Paragraph Meaning test, Average Reading, Spelling test, Language test and Arithmetic Concepts test. There was no significant difference between findings in the Arithmetic Computations test, Arithmetic applications test, arithmetic Mean, nor in the Grand Battery Mean.
- (3) Both groups made significant gains in their achievement test scores over the ten month period.

According to the results of this study it would appear that low achievers of the type that took part in





this study appear to profit academically from the stimulation of being in a classroom with regular class children. If this is in fact a correct assumption the specially segregated classes as they now exist for this type of student should be reappraised with the possibility of replacing these special segregated classes with the partially integrated program.





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## Table of Contents

Chapter I.	Page
Introduction. . . . .	1
Orientation to the Problem. . . . .	1
Statement of the Problem. . . . .	1
Null Hypotheses . . . . .	2
Conceptual Framework of the Problem . . . . .	3
Need for the Study. . . . .	4
Definition of Terms . . . . .	6
Scope of the Study. . . . .	8
Limitations of the Study. . . . .	9
Assumptions . . . . .	10
Procedures and Data Analyses to be Employed. . . . .	11
Chapter II.	
Review of Related Literature . . . . .	12
Grouping. . . . .	12
Ability Grouping Research Reviews . . . . .	13
Efficacy Studies Comparing Special Classes and Regular Classes. . . . .	14
Regular Classes . . . . .	14
Disadvantages of Special Classes for Educationally Handicapped Students. . . . .	23
Advantages of Special Classes for Educationally Handicapped Students . . . . .	25
Integration of Exceptional Children into Regular Classes. . . . .	27



Summary . . . . .	32
Chapter III.	
Procedures . . . . .	33
Population Selection Procedure . . . . .	33
Nature of the Population . . . . .	34
Experimental and Control Group	
Formation . . . . .	38
Nature of Experimental and Control	
Groups . . . . .	39
Description of Special Segregated	
Classes . . . . .	39
Description of Partially Integrated	
Classes . . . . .	43
Description of Teachers . . . . .	46
Research Design . . . . .	47
Data Collection . . . . .	49
Description of the Instruments . . . . .	50
The Canadian Lorge-Thorndike Intelligence	
Test . . . . .	50
The Stanford Intermediate Achievement	
Test II Partial Battery . . . . .	51
Types of Scores . . . . .	51
Norming . . . . .	51
Validity . . . . .	52
Reliability . . . . .	52
Test Administration Procedure . . . . .	52
Treatment of the Data . . . . .	54





Chapter IV.	Page
Analyses of Data and Summary of Findings. . .	66
Hypothesis 1 and Results. . . . .	67
Hypothesis 2 and Results. . . . .	85
Hypothesis 3 and Results. . . . .	91
Summary of Findings. . . . .	93
Chapter V.	
Conclusions, Implications, Limitations and Recommendations for Further Study . . .	97
Conclusions an Implications. . . . .	97
Recommendations for Further Study . . . . .	101
Bibliography. . . . .	103





## List of Tables

Table		Page
1	Description of Population of Low-Achievers. . . . .	35
2	Distribution of Population of Low-Achievers. . . . .	36
3	Description of Experimental and Control Groups. . . . .	40
4	F Test-Differences Between Variances . . . . .	58
5	Welch T Prime Approximation on Variables . . . . .	61
6	T Tests. . . . .	63
7	Statistical Comparison of Achievement Between the Control and Experimental Groups for the Stanford Achievement Word Meaning Test . . . . .	68
8	Statistical Comparison of Achievement Between the Control and Experimental Groups for the Stanford Achievement Paragraph Meaning Test. . . . .	71
9	Statistical Comparison Between the Control and Experimental Groups for the Stanford Achievement Spelling Test. . . . .	74
10	Statistical Comparison of Achievement Between the Control and Experimental Groups for the Stanford Achievement Language Test . . . . .	75a



11	Statistical Comparison of Achievement Between the Control and Experimental Groups for the Stanford Achievement Arithmetic Computations Test. . . . .	78
12	Statistical Comparison of Achievement Between the Control and Experimental Groups for the Stanford Achievement Arithmetic Concepts Tests. . . . .	80
13	Statistical Comparison of Achievement Between the Control and Experimental Groups for the Stanford Arithmetic Applications Test. . . . .	83
14	Statistical Comparison of Achievement Between the Control and Experimental Groups for the Stanford Achievement Reading Mean. . . . .	86
15	Statistical Comparison of Achievement Between the Control and Experimental Groups for the Stanford Achievement Arithmetic Mean . . . . .	89
16	Statistical Comparison of Achievement Between the Control and Experimental Groups for the Grand Battery Mean of the Stanford Achievement Test. . . . .	95
17	Correlated "t" tests . . . . .	96





## List of Figures

Figure		Page
1	Development of Word Meaning Skills Over a Ten Month Period . . . . .	70
2	Development of Paragraph Meaning Skills Over a Ten Month Period . . . . .	72
3	Development of Spelling Skills Over a Ten Month Period . . . . .	75
4	Development of Language Skills Over a Ten Month Period . . . . .	76
5	Development of Arithmetic Computations Skills Over a Ten Month Period . . . . .	79
6	Development of Arithmetic Concepts Skills Over a Ten Month Period . . . . .	82
7	Development of Arithmetic Application Skills Over a Ten Month Period . . . . .	84
8	Development of Average Reading Over a Ten Month Period . . . . .	88
9	Development of Arithmetic Mean Over a Ten Month Period . . . . .	90
10	Development of Grand Battery Mean Over a Ten Month Period . . . . .	92





## Chapter I

### Orientation to the Problem

In a democracy where each individual has the freedom to make personal decisions and also exercises a voice in the determination of public policy a citizenry must be capable of making intelligent decisions. The disabled learner such as the low-achiever offers a special challenge to any educational system in that such children require specialized remedial assistance.

Provision of such specialized remedial assistance for these children has been one of the goals of the public schools in their attempt to meet one of the basic principles of our democracy--the right of every child to the kind of education through which he can realize his potential and become within his capacities, a useful member of society.

### Statement of the Problem

The purpose of this study was to compare and to evaluate two types of classroom groupings for low-achievers at the grade seven level. In one grouping selected low-achievers were enrolled in and attended specially segregated classrooms full time to receive remedial academic instruction. In the second grouping selected low-achievers were enrolled in regular grade



seven classrooms and obtained much of their instruction within the regular grade seven classroom. This group of students attended a specially segregated classroom for only part of the day to receive remedial academic instruction as determined by their individual requirements. They were 'partially integrated' into the regular grade seven program of studies.

Thus, a comparison between the group of low-achievers attending specially segregated classes with a comparable group of low-achievers attending partially integrated classes was in order. This comparison involved academic achievement as measured by the Stanford Intermediate Test II Partial Battery (SAT).

### Null Hypotheses

The two types of classroom groupings were compared by testing the following hypotheses:

1. That there is no significant difference ( $p < .05$ ) in academic achievement test results between the partially integrated class group as compared to the specially segregated class group in the following subtests of the SAT:

- a. Word Meaning
- b. Paragraph Meaning
- c. Spelling
- d. Arithmetic Computations





- e. Arithmetic Concepts
- f. Arithmetic Applications

2. That there is no significant difference ( $p < .05$ ) in academic achievement test results between the partially integrated class group as compared to the specially segregated class group in:

- a. Reading Mean (This score is the arithmetic mean of the Word Meaning scores and the Paragraph Meaning scores.)
- b. Arithmetic Mean (This score is the arithmetic mean of the Arithmetic Computations scores, the Arithmetic Concepts scores and the Arithmetic Applications scores.)

3. That there is no significant difference ( $p < .05$ ) in the Grand Battery Mean between the partially integrated class group as compared to the specially segregated class group.

### Conceptual Framework of the Problem

In September, 1961 a pilot study was undertaken within the Edmonton Separate School System. This pilot study was an attempt to provide a satisfactory solution to the problem of many junior high school students not being able to cope with the regular classroom program of studies. According to Quinlan (1964) who conducted this pilot study some of these students took from seven



to eight years to complete a six year elementary school program. He further explains that not all of these low-achievers are slow learners (with IQs below 90) but that about 50% of them fall within the normal range of ability.

If these students were to continue on with their education, they would have to be provided with a special program of studies. This special program of studies came in the form of specially segregated classes (SSC) with limited enrolment, only one teacher and concentrated remedial instruction. It was hoped that such a program would provide the student with a successful transition into the regular junior high school.

In the last several years since SSC were instituted a number of problems have developed. Some of these problems included:

1. The students attending the SSC were isolated from regular classroom students.

2. Students and parents often felt there was an unfavorable stigma attached to the SSC.

3. The SSC was not considered to be a program conducted by the school, but rather a program housed in the school and operated by the Special Education Department.

4. To some extent the SSC teacher was isolated since he taught a specific group of students with little or no interaction with regular class students.





5. It was often difficult to place SSC students in a regular class in midyear due to the reluctance of regular class teachers to accept them. This was often warranted when a student's achievement came up to a regular class level.

### Need for the Study

At a meeting of the grade seven SSC teachers of the Edmonton Separate School System on February 5, 1969 the structure of these classes was discussed at great length. The teachers involved were very concerned that the SSC organization should be improved upon. These teachers proposed that students previously assigned to SSC be placed in regular classes in the future and that they receive remedial assistance from the SSC teachers only on a part time basis to the extent each student required it. In this manner the SSC teacher would assume a resource teacher role in the partially integrated setting.

This change in emphasis has merit because:

1. Students in SSC are more similar to their peers in regular classes than different.
2. Most students in these classes require special assistance in some subjects but not necessarily in all.
3. The large junior high school should have the resources to assist the student who is now in the SSC.



4. Educational research has not demonstrated that such students are better adjusted in SSC than they are in regular classes.

5. Educational research has not demonstrated that such students do better academically in SSC than they do in regular classes.

In view of the difficulties that arose with SSC for low-achievers, it was believed that this study would provide some basis upon which future programs for low-achievers might be administered.

The partially integrated classes (PIC) would maintain the strengths of the traditional SSC program without most of the accompanying deficiencies.

1. The stigma attached to the placement of low-achievers in a SSC would be largely removed.

2. These children would be of concern to other teachers at the junior high school level rather than only to the SSC teacher.

3. The student would be more involved in academic and extracurricular activities if he is part of the regular grade seven student body.

4. Difficulties in timetabling students into the regular classes would be overcome.

5. The SSC teacher would assume a resource teacher role to the junior high school staff.

6. Implementation of this proposal would allow for a continuation of the program at the grades eight





and nine levels for those students who require continued program modification and remediation.

7. More students needing remedial help could be reached by the implementation of such a program.

In conclusion, this study is significant because it is imperative that there be continued experimentation and contribution to learning theory in the classroom to meet the needs of all types of students including the low-achiever.

#### Definition of Terms

The following terms are defined as they are used in this study:

##### Elementary:

Elementary refers to grade one up to and including grade six.

##### Junior high school:

Grades seven, eight and nine are referred to as junior high school.

##### Achievement:

Achievement refers to grade scores obtained on the Stanford Intermediate Achievement Test II Partial Battery. The test manual explains grade scores as follows:

This grade score may be translated into a grade equivalent by placing a decimal point before the last digit. The grade equivalent indicates the median score made by pupils



at a specified grade placement. (1964, p. 17)

Thus, a grade score of 46 would have a grade equivalent of 4.6. Subtests in this achievement test battery include paragraph meaning, word meaning, spelling, language, arithmetic computations, arithmetic concepts and arithmetic applications.

Low-achiever:

A low-achiever in this study is a student who has come to the end of elementary school, but who is unable to cope with regular junior high school work on a full time basis. He is generally typified by performing considerably below (one year or more) the level normally expected of his age and grade.

Edmonton Separate School System:

School district set up by the Catholic residents of the city of Edmonton.

Partially integrated grade seven classes:

In this grouping plan, low-achievers are enrolled in a regular grade seven classroom and obtain much of their instruction within the regular class. In addition the students go to the SSC or resource room for instruction and to use special materials as determined by individual requirements.

Specially segregated grade seven classes:

These are classes set up to provide a special program of instruction designed specifically for low-achievers who have come to the end of elementary school



but who are unable to cope with regular junior high school work. The students attending special segregated grade seven classes receive all of their remedial instruction from one teacher.

Experimental group:

All students attending the partially integrated classes form the experimental group.

Control group:

All students enrolled in the special segregated classes on a full time basis form the control group.

Scope of the Study

1. The study covered a one school year period of ten months.

2. The study was confined to the Edmonton Separate School System and did not include public schools or private schools.

3. The study was delimited to achievement as measured by the Stanford Intermediate Achievement Test Partial Battery II. Other purposes of education such as social and personal adjustment were not evaluated.

4. The study concentrated on SSC at the grade seven level and did not take into account SSC at the grades eight and nine levels.

5. The study consisted of those junior high school low-achievers that had been selected by the central school administration upon the recommendations of the





students' former teachers, principals and guidance counsellors.

### Limitations of the Study

1. The kinds and amount of data collected was limited to that which was made available to the investigator by the participating schools and the central school administration. This included school records, reports, and recorded impressions of the investigator during school visits and the teachers involved in the study.

2. The study was limited to an experimental group of 50 students and a control group of 92 students.

3. The Stanford Intermediate Achievement Test was the only basis upon which academic achievement was determined. This test battery was selected by the central school administration.

4. Although the teachers in this study were an important variable no attempt was made to study the teachers' role experimentally as to their influence in the students' academic progress.

5. The study was limited by the fact that the investigator was unable to assign subjects randomly into experimental and control groups. Instead subjects were placed into these respective groups by the central school administration--largely for the expediency of placing the low-achiever in the closest school that had



a special grade seven program (either partially integrated or segregated) thereby, minimizing transportation expenses.

6. The bias of "selectivity" may have occurred when the central school administration assigned teachers to the experimental and central groups.

7. The ten schools involved in this study were scattered throughout the city of Edmonton. Consequently, it is possible that students attending these schools may have had different socioeconomic backgrounds.

8. It is possible that all the students participating in the study were not equally motivated to do their best in the achievement tests.

9. Experimental mortality places a limitation on this study. Six students were lost from the experimental group and nineteen students were lost from the control group over the ten month study period.

All the conclusions in this study are subject to the forementioned limitations.

### Assumptions

1. It was assumed that the Lorge-Thorndike Intelligence Test was a valid measure of student intelligence.

2. It was assumed that the Stanford Achievement Test was a valid measure of pupil achievement.

3. The assumption was made that the tests were administered to all students under similar conditions as





prescribed by the test manual.

4. Since no other method was found that would produce a more valid achievement test score, equal weighting of the various subtests to arrive at an overall achievement score was assumed to be a valid method of weighting.

#### Procedures and Data Analyses to be Employed

To make a comparative study of the achievement of the pupils in the experimental and control groups each of the null hypotheses was tested twice--once after five months the study was in progress and secondly after ten months the study was in progress or at the termination of the study. A one-way analyses of covariance was employed comparing the September to January achievement test results and a second one-way analyses of covariance was done comparing the September to June achievement test results.

In addition a correlated t-test was employed to determine whether significant achievement gains had been made by both groups at the end of the experimental period.

Finally, at the conclusion of the study the teachers in the experimental group were asked to express their views as to the effectiveness of the PIC.



## Chapter II

### Review of Related Literature

In the past fifty years a great deal of literature has been written and research done in the area of grouping of students for instructional purposes. The present chapter is devoted to conveying the nature of some of this literature and past research.

### Grouping

Willard D. Olson defines grouping as "the process of classifying pupils for instructional purposes on the basis of predetermined criteria" (1966, p. 25). In elaborating upon this definition he says, "the pupils may be grouped on the basis of chronological age, sex, mental test scores, reading ability, interests, behavior, achievement in one subject or across the board, or any combination of these or other characteristics" (1966, p. 25).

According to the Educators' Encyclopedia heterogeneous grouping is the administrative pattern where "children are . . . arranged without consideration for their interests, abilities or achievement" (1961, p. 70). The Educators' Encyclopedia also distinguishes between the terms homogeneous grouping and ability grouping. It explains that "when children are assigned on the basis of a similarity such as interests, abilities,



achievement, or a combination of these factors, it is called homogenous grouping" (1961, pp. 70 & 71). The encyclopedia further states that "since the ability of the child is the most common factor considered in this type of assignment (homogenous grouping), it is often referred to as ability grouping" (1961, p. 71).

### Ability Grouping Research Reviews

The National Education Association reviewed fifty research findings since 1960 on ability grouping and drew the following conclusions:

- (1) Ability grouping has yet to prove itself as an administrative device to meet both effectively and efficiently the individual needs for all pupils in most areas of educational concern.
- (2) More and better research is needed to measure or control a larger number of the variables involved.
- (3) Objectives, materials, curriculum, and teaching methods should also change when instructing groups at different ability levels (1968, p. 44).

The Encyclopedia of Educational Research has this to say about ability grouping research. "Major studies since 1959 have found no clear and consistent effect of ability grouping in students' achievement when total student populations were used" (1969, p. 565).

Passow expresses a similar opinion:





Even as the number of grouping studies have accumulated over the past three decades, the inconclusiveness of the research findings becomes more apparent as each reviewer couches his summary in tentative or equivocal fashion (1962, p. 285).

The remainder of this chapter delves deeper into ability grouping research and literature specifically in the area of special education comparing special classes versus regular classes for exceptional children such as the emotionally disturbed, the educable mentally retarded, and the slow learner. This chapter is concluded with a section on the integration of exceptional children into regular classes.

#### Efficacy Studies Comparing Special Classes and Regular Classes

The tremendous interest in, and expansion of, special class programs has led to the question, "Is the special class the best administrative approach within which to teach educationally retarded children?" The attempt to answer this question has prompted a great deal of research. One early study comparing students in regular classes versus special classes was done by Bennett (1932). In her study Bennett compared 50 mentally retarded and dull-normal children placed in special classes with 50 mentally retarded and dull-normal children in regular classes. Her results indicated that in school



achievement regular grade children performed significantly better academically.

A study similar to Bennett's was carried out by Pertsch (1936). Pertsch compared two groups matched for chronological age, mental age and intelligence quotient. Pertsch also came to the conclusion that those remaining in the regular grades were superior in educational achievement to those students placed in special classes.

Johnson (1962) believes the above studies were inconsequential since they were not followed up and have had little or no influence upon the development of special education programs. Johnson expands:

. . . the children in both the experimental and control groups in each of the studies were selected from the same school systems. Thus, while they were equated for CA, MA, and IQ, such important factors as initial academic performance, personal adjustment, and social adjustment, and physical and sensory abilities were not equated. Secondly, the areas measured may not have been representative of the objectives (or what should have been the objectives) of the special programs. Before any meaningful evaluation can be made, the objectives of special education for the mentally handicapped must be defined and the evaluation then made in respect to these objectives (1962, pp. 62 & 63).

Elenbogen (1957) comparing achievement of mentally retarded children in special and regular classes also found significantly higher achievement test performances for children in regular classes.

Blatt (1958) attempted to overcome the selection





factor which invalidated previous study results. He matched 75 educable mentally retarded children in special classes in one school system with similar children in regular classes in another school system which did not have special classes. Blatt's results indicated no significant differences in achievement between the two groups in reading, arithmetic and language.

Cassidy and Stanton (1959) following a design resembling Blatt's comparing 100 special class children with 94 children in regular grades found that the regular group had higher achievement.

Thurstone (1959) attempted to compare the intellectual growth, academic achievement, social development, and gross motor skills of educable mentally handicapped children enrolled in regular and special classes in North Carolina. The first evaluation one year after the study had begun with the Stanford Achievement Test showed that the regular class retardates had significantly higher achievement scores than the special class children in all areas except arithmetic computation. Testing repeated at the end of the second year of the study showed there were no significant differences between the gain scores for regular and special class children.

Ainsworth (1959) compared educable mentally retarded children in three different school environments--special class, regular class with an itinerant specialist,



and regular class with no special services. The Ainsworth study found that all three groups made progress but that there were no significant differences in achievement between the groups in reading, arithmetic and language.

Mullen & Itkin (1961) compared 140 mentally retarded children in special classes with another 140 retarded children who were in regular grades. These children were matched according to the following variables: age, IQ, sex, socioeconomic community ratings, reading achievement, school attendance in the rural south, and foreign language spoken in the home. Basically this study found that there were no significant differences in achievement between the two groups except for the fact that the regular class students gained more in arithmetic than the special class children.

In an excellent review of comparative work in special education Kirk summarizes the results of a number of American studies done in the last several decades. These include studies done by Bennett (1932), Pertsch (1936), Blatt (1958), Cassidy and Stanton (1959), Elenbogen (1957), Thrustone (1959), Ainsworth (1959), Mullen and Itkin (1961). Kirk makes the following general comments about these studies:

- (1) the children assigned to special classes are equal to or inferior in academic achievement to those remaining in the regular grades,



- (2) the children at the lower range of educability show equal or superior academic achievement to similar children left in the regular grades,
- (3) in social adjustment the special-class groups appear superior to those left in the regular grades, and
- (4) the retarded children in the regular grades tend to be isolated and rejected by his normal peers (1964, p. 92).

Kirk continues with his summary of the above studies by cautioning the reader about the conclusiveness of this research.

Any generalizations made from the studies are questionable, since the studies suffered from the in situ nature of the investigations, lack of control of the selection factor, the short period of time the children were enrolled in special classes after failure in the regular grades, little definition of the programs of the special classes, and the questionable reliability and validity of the instruments used to measure achievement and adjustment (1964, p. 92).

Kirk (1964) concludes his summary by making two recommendations for future studies comparing children in special classes and regular classes. One of these is the need for a comprehensive longitudinal study of the effects of special classes beginning when children are six years of age. The second recommendation is the development of a special class group should be compared with that of a randomized group of retarded children remaining in the regular grades.

Goldstein, Moss & Jordan in their summary of previous research feel that "at the present time, . . .





there is no clear-cut empirical evidence to support the belief that retarded children placed in special classes show greater development in intellectual, academic, or social adjustment" (1965, p. 9). They levy criticisms similar to those of Kirk (1964) and Johnson (1962) about previous studies.

Previous studies of the efficacy of special classes for educable mentally handicapped children reveal the following methodological inadequacies:

- (a) Sample selection was not controlled adequately;
- (b) No consideration was given to the effects of the varying school experiences of special class children;
- (c) There were no indications of "specialness" in the special class educational program or in the preparation of the teacher; and
- (d) Serious discrepancies existed between the goals of the special class and the measures chosen as the indicators of effectiveness (1965, p. 15).

In their study Golstein, Moss and Jordan (1965) attempted to overcome the methodological difficulties of previous studies. They study begin with 1,938 children from which they identified 126 children from three school districts where primary level special classes did not exist. Placement was randomly determined for roughly one half of these children in special classes (experimental) while the remaining ones were assigned to regular classes (controls). The duration of the study was four years with the children being retested at the end of each



school year. The results of the Goldstein et al. (1965) are summarized briefly.

1. After the first year of the study both the experimental and the control groups had gained significantly in intelligence, as measured by the Stanford-Binet test. There was no significant increase in IQ in the following years of the study.

2. At the end of the first year the regular class children were significantly ahead in their reading, but there were no great differences in the arithmetic scores obtained by the two groups. By the end of the second year there were no significant differences in reading between the two groups, but differences were significant in arithmetical computation and reasoning in favor of the special class children.

3. By the end of the fourth year results indicated that the children in special classes gained more in academic achievement than did similar children in regular classes.

Tizard (1966) cautions special educators about becoming overly enthusiastic over the Goldstein et al. study results. Generally Tizard agrees that the research done by Goldstein and his colleagues is much better designed than any other previous enquiry of this kind. In spite of this he feels that it would be a mistake to conclude from it that the education in special classes



for backward children was necessarily superior to what could be given in ordinary classes.

Tizard contends that the teachers selected for the experiment were young, comparatively inexperienced persons who had all completed the Bachelor's degree with specialization in the education of the retarded. In addition they were given the support, guidance, and coordination of a knowledgeable supervisor who worked with them frequently and consistently.

Tizard wonders whether these same teachers, given the support, guidance, and coordination of the knowledgeable supervisor, would have done as much for these same children in ordinary classes. Tizard also states that it is not known what went on in the ordinary classes in which the control children were placed and how far the teaching methods there could have been improved.

Guskin & Spicker (1968) also delve into some of the design limitations of the Goldstein et al. study. First, they feel that by dealing with primary special classes initiated for six year olds, the study revealed little about the more common special class for children beyond the age of eight. They also contend that in selecting children on the basis of IQ alone rather than classroom learning problems, the study revealed little about the effectiveness of special classes for children who have been selected by teachers for demonstrated





difficulties. Another criticism made is that since only four special classrooms and ten carefully selected teachers were involved in the study, one has no idea about the specificity of the findings to the peculiar motivation, competence, and training of these teachers or the adequacy of the classroom setting.

Thus, as Tizard, and Guskin and Spicker have shown that even a classic study such as Goldstein's et al. leaves many questions that remain to be answered about special class versus regular class placement of exceptional children. There is little doubt about the fact that more efficacy studies are required with every effort being made to overcome the shortcomings of previous studies. Johnson made a statement about the dilemma which special education finds itself in. This statement appears to be as applicable today as it was when he made it.

It is indeed paradoxical that mentally handicapped children having teachers specially trained, having more money (per capita) spent on their education, and being enrolled in classes with fewer children and a program designed to provide for their unique needs, should be accomplishing the objectives of their education at the same or at a lower level than similar mentally handicapped children who have not had these advantages and have been forced to remain in the regular grades (1962, p. 66).



Disadvantages of Special Classes for Educationally  
Handicapped Students

The following section concerns itself with statements and opinions expressed by various special educators about the shortcomings of special classes for educationally handicapped students. It should be recognized that these statements and opinions are not necessarily supported by research but that they are made by recognized experts in the field of special education.

A major concern of many special educators in regards to the use of special classes is the one expressed by Featherstone: "unless one is extremely careful and critical, the segregated class for slower pupils becomes a dumping ground for all the misfits in school" (1951, p. 11).

According to G. O. Johnson, "the slow learners are so nearly normal in their intellectual development that, except in academic situations, it is extremely difficult to distinguish them from the norm in terms of their general personal and social adjustment and understandings" (1964, p. 92). With this in mind he contends that these children can associate with other children on a relatively equal basis in social and recreational activities. Johnson believes that special classes would tend to deprive these children of the opportunity for casual contacts in natural school situations that are



essential to their education. In addition he feels that a stigma is easily attached to students who attend special classes thereby setting the slow learners apart from the other children. Johnson also criticizes the watered down types of curricula so commonly found in special classes which do little more than to alienate these children further against school.

Ernest Newland brings the following argument to bear against the establishment of special classes. "To the extent that special classes are publicized as being operative for children who are different, to that extent are the members in them likely to be perceived--and to perceive themselves--as different" (1960, p. 324).

Newland expresses a second concern about special classes:

The dangerous paradox lies in the fact that special education, originally intended to make easier and more effective the meeting of individual needs on a high individualized basis, actually can result in the special teacher's employing psychological and educationally unwarranted class procedures on children who have been pulled out of the main educational stream because they needed individual attention (1960, p. 326).

Still another possible side-effect of special classes is considered by Newland to be one of the most important and least desirable. "When special services are added to the school's program for those children who have been found to need such services, and when those





services are provided by persons especially trained to render them, the regular-class teachers tend to relinquish, more than should be the case, responsibility in the area for which such services are intended. . ." (1960, p. 327). Newland visualizes rampant possibilities if the situation in a school deteriorates to this level:

Regular classroom teachers, knowing that there is a specialist for this and one for that, are likely consciously or unconsciously, to relinquish the responsibilities which they well can and should maintain, or even learn to acquire. They may be a little too quick to refrain from working correctively (or even preventively) with the child who has a mild speech impairment or the bright child, or the slow child, if they have the attitude that they can just "turn over" any such child to the appropriate specialist. They may even reach the point where they fail to follow up or support the work of the specialist in the regular classroom (1960, p. 327).

### Advantages of Special Classes for Educationally Handicapped Students

Despite the fact that special classes have not proved themselves equivocally in efficacy studies a large number of educators place a great deal of faith in them. Heck reveals this very sentiment when he states:

There are many educators who claim that children of low I.Q. cannot be educated satisfactorily in regular classes. They claim that methods and curriculum need radical changes to meet the needs of children of low I.Q. This they claim



cannot be done by regular classroom teachers with their heavy pupil-teacher ratios. They further claim that regular teachers do not have the preparation needed to teach these children successfully (1953, p. 359).

Heck (1953) points to other testimonials made by special educators espousing the effectiveness of the special classroom. Among these include past records revealing pupils formerly being discipline problems ceased to be. Pupils who were hopelessly discouraged and forlorn were now happy and hopeful toward the future. Pupils who previously made no academic progress showed signs of making an effort in academic work and were making slow progress. Finally, pupils who initially had little opportunity to develop their skills in shops or handicrafts were showing such skills as to be vocationally placeable.

Johnson states that the special class teacher usually has a greater leeway in curriculum and program planning and is not as restricted to prescribed grade requirements as is the regular class teacher. In many cases the special class has a curriculum to provide specifically for the slow learners. Johnson contends that "a competent teacher of a special class who has an understanding of the characteristics and problems of the slow learner will usually be able to give the kinds of educationally experiences that will be of greatest value to them" (1963, p. 92). Thus, the program in a



special class can be tailored to the needs of the specific type of student in the special classroom. This may prove very difficult to accomplish in a regular classroom situation.

### Integration of Exceptional Children Into Regular Classes

In educational circles today, as perhaps never before, one hears a great deal about the integration of educationally handicapped students into the regular grades as compared to segregating these children in special schools or special classes. The purpose of this section will be to examine the meaning of the term "integration" as it applies to special class programs for exceptional children. In addition the literature will be reviewed in an effort to determine some of the pros and cons of the "integration versus segregation" issue.

Webster defines integration as the "act or process of integrating," to integrate means "to unite or become united so as to form a complete or perfect whole." Brabner defines integration as it would apply in a school situation as "those social-psychological interactions, occurring spontaneously or by design in the relations of all individuals and groups whose welfare is directly affected by the total school program, which tend toward a diminution of conflict within individuals, between individuals, between individuals and groups and between





groups" (1964, p. 106).

Fuchigami & Sheperd use the term 'integration' in the following context. "The term 'integration' has been used when educable mentally handicapped children are placed in regular classes for part of the school day or are otherwise allowed to participate in the regular school activities with normal children" (1968, p. 18). They define segregation as "attempts to keep the educable mentally handicapped children in special classes all day or discourage the participation of the children in the activities with normal children" (p. 18).

Guerin points out that all exceptional students do not need special classes, "individual tutoring, small disability groups, resource teachers and resource rooms have often proven an effective replacement for the special self-contained class" (1967, p. 40). Guerin goes on to elaborate on exceptional children integrated in regular classroom and attending resource rooms to receive help in their specific areas of academic weaknesses:

In a resource program each educable retarded student would be assigned to a regular class as if no special class existed. A regular class teacher with a special student would have a slightly smaller class size to compensate for time in conferences with the resource room teacher. The regular teacher would be encouraged not to give greater class time to the exceptional students. . . . A resource class program could accommodate more students within a day than is usual in a self-contained class program but within any given hour the number of students would be considerably less than is common



current practice. The special teacher in part could plan and group students into certain hours depending on their needs and levels of achievement (1967, p. 41).

Dunn (1968) takes a position similar to that of Guerin. He suggests that disability labels and the practice of grouping children homogenously into special classes by these labels be done away with. Like Guerin, Dunn feels that slow learning children should be kept more in the mainstream of education, with special educators serving as diagnostic, clinical, remedial, resource room, itinerant and/or team teachers, consultants and developers of instructional materials and prescriptions for effective teaching.

Reynolds (1962) also recommends a program where educationally handicapped children are enrolled in regular classes and special resource rooms are provided in the schools. The children in this situation would spend a part of each day in the resource room, sometimes on a definite schedule and sometimes on an irregular schedule according to the special needs as they arise through the school day. The resource room would include all the necessary special equipment and materials and the specially trained teacher in charge would coordinate his teaching with that of the regular classroom teachers.

Baarstaad is of the opinion that educationally handicapped children require individualized programs, which make great demands upon the teachers. The pupils



are rarely working on identical material. Baarstaad states that these students need help in improving skills in which they are deficient, social assistance, emotional support and encouragement in the preparation of assignments for the regular class. "As the resource room teacher meets these needs, she enables the pupils to participate more fully in the regular class, and thereby gains the self-assurance they so often need" (1965, p. 15).

Simpson (1959) feels that through participation in regular classes and in various school activities with students of normal intelligence, the mentally retarded pupil has an opportunity to become accustomed to working and playing in groups such as those he will encounter in his endeavours after he has completed school. The pupil will also learn that he must accept the suggestions made by others and accept the place in the group his limitations force upon him. Lastly, such participation according to Simpson would allow the handicapped pupil to make a self appraisal on the basis of his accomplishments in the group.

Although there is much to be said for integrating educationally handicapped children into regular classes and giving them special remedial help in resource classes, Johnson feels certain cautions must be kept in mind when considering integrated classes:

In integration, . . . , there is a basic principle that must be adhered to if it is





that a child should be placed in that educational setting where the experiences have value to him and in which he can learn. The underlying assumption is that his level of ability or intellectual sophistication is about equal to that of the rest of the class. He must not be so significantly different that it is obvious to everyone that he does not belong. This must be remembered when planning experiences for the slow learners in the special areas (1963, p. 167).

After an extensive review of the literature, the investigator was able to find only one study which compared educationally deprived students in special segregated classes with those in a partially integrated setting. Carroll (1967) compared the effects of two types of school programs (segregated and partially integrated) upon academic achievement of educable mentally retarded (EMR) children. Achievement was measured by the Wide Range Achievement Test which included reading, spelling and arithmetic subtests. According to Carroll, no attempt was made to control teacher techniques. The study showed that the EMR partially integrated group made significant growth in the area of reading, but no significant difference between the EMR groups was found in the areas of spelling and arithmetic. Therefore, the results of this study partially supported the hypothesis that EMR children in a partially integrated setting would show greater growth in academic achievement than would EMR children in a segregated setting.



Summary

Since there is a dearth of studies in the area of comparing exceptional children in partially integrated classes with children attending fully segregated special classes it is obvious further research is needed. As in the case of the special segregated class versus regular class controversy no firm conclusions can be drawn.



## Chapter III

### Procedures

This chapter has been divided into the following subsections: population selection procedures; nature of the population; experimental and control group formation; nature of experimental and control groups; description of special segregated classes; description of partially integrated classes; research design; data collection; description of the instruments; test administration procedure and treatment of data.

#### Population Selection Procedure

At the end of June, 1969 one hundred and sixty-seven low-achievers at the grade seven level were selected from throughout the Edmonton Separate School System to the special education program. The selection criteria included:

1. The student was recommended by the principal, classroom teacher, and guidance counsellor who felt that the student would profit little by remaining in a regular classroom full time. Final approval for the student entering the special education program was given by the central school administration. The investigator was not involved in any manner in the selection of these students.





2. The student had spent more than the average amount of time (six years) in the elementary grades. In other words, the achievement level of the student was one or more years below the expected grade level.

3. Parental consent had to be given in order that a child be placed in the grade seven special education program.

4. Students with severe emotional and behavior problems were not recommended for placement in the grade seven special education program.

As Table 1 indicates due to experimental mortality the number of students dropped to fifty in the experimental group and ninety-two in the control group during the duration of the study. These concluding figures were the ones used in all of the statistical analyses.

The first three schools in Table 1 made up the experimental group and the remaining seven schools comprised the control group.

#### Nature of the Population

Table 2 contains a description of the population of low-achievers involved in this study. This table indicates that the average age of these students is about 161.45 months or about 13.5 years.

Using the Canadian Lorge-Thorndike Intelligence Test Battery, the mean verbal intelligence quotient of



TABLE 1

## DISTRIBUTION OF POPULATION OF LOW-ACHIEVERS

School	Number of students	
	September	June
St. Basil JHS	20	19
St. Thomas More JHS	18	16
St. Gabriel JHS	18	15
St. Francis JHS	15	12
Mount Carmel JHS	15	13
St. Clare JHS	18	15
Holy Cross JHS	16	14
St. Edmond JHS	16	12
Sacred Heart JHS	14	12
Grandin JHS	17	14
Total	167	142



TABLE 2  
 DESCRIPTION OF POPULATION OF LOW-ACHIEVERS  
 SEPTEMBER, 1969  
 N = 142

	Mean	Standard Deviation
Chronological Age (in months)	161.45	8.82
Intelligence Quotient		
(i) Verbal	88.39	10.50
(ii) Nonverbal	91.61	12.38
Word Meaning	43.68	9.18
Paragraph Meaning	43.64	11.03
Average Reading	43.89	9.35
Spelling	45.86	13.75
Language	40.44	11.25
Arithmetic Computation	46.33	11.32
Arithmetic Concepts	50.27	10.29
Arithmetic Applications	46.67	11.66
Arithmetic Mean	47.77	9.05
Grand Battery Mean	45.30	7.58





this student population is 88.39 and the mean nonverbal intelligence quotient is 91.61. The standard deviation of the nonverbal intelligence quotients is 10.50 as compared to a standard deviation of 12.38 for the verbal intelligence quotients. These mean intelligence quotients are both below the considered mean intelligence quotient of 100 and would seem to indicate that many of these students border on the slow learner or dull normal (IQ 75-90) of mental ability.

The remainder of Table 2 gives the component subtest results of the SAT as well as the grand mean for the entire test battery. These scores are to be read as grade equivalents. A score of 43.64 can be approximated to a grade equivalent of about 4.4 obtained simply by moving the decimal one place to the left. The scores vary from a low of approximately grade 4.0 for the language test to a high of grade 5.0 for the arithmetic concepts test. These figures including the grand mean of 4.5 for the entire test battery of the SAT indicate that these students are working about 2.5 grade equivalents below the expected grade seven level at which other students of similar chronological ages would perform. Therefore, these students can be referred to as low-achievers.



### Experimental and Control Group Formation

The one hundred and sixty-seven low achievers at the grade seven level were assigned into the experimental group and the control group by the central school administration. The experimental group which was to attend the partially integrated classes consisted of fifty-six students who were placed in three junior high schools in the Edmonton Separate School System. One hundred and eleven students making up the control group were placed in special segregated grade seven classes in seven different junior high schools of the same school system.

Upon consulting with the central school administration it appears the students were not randomly (no table of random numbers was used) assigned to the experimental and control groups. Although this was the case there was no reason on the part of the investigator to suspect differential recruitment related to placement. In placing these students either in the control group or the experimental group no other known criteria other than ease of transportation of the students to and from school were used. In other words, an effort was made to accomodate the students in schools as close as possible to home so as to minimize travelling time and distance to and from school.



### Nature of Experimental and Control Groups

Table 3 compares the experimental and control groups in terms of chronological age (in months), Intelligence Quotient (verbal and nonverbal) and achievement test scores of those students remaining at the end of the study. It is particularly important to note that with the exception of chronological ages the mean scores of the experimental group are higher than those of the control group. On the SAT these differences vary from .1 of a grade equivalent for Arithmetic Concepts to approximately .6 of a grade equivalent for Language. There is a difference of 3.87 IQ points in the verbal test and a difference of 3.93 IQ points on the nonverbal tests--both in favor of the experimental group.

### Description of Specially Segregated Classes

SSC were first set up in the Edmonton Catholic Schools during the 1961-62 school year. The chief purpose of these classes was to provide individualized instruction suited to the needs of low-achievers who had come up to the end of elementary grades but were unable to cope with regular junior high school. In effect these classes had been established on the belief that by placing the low-achieving student in a SSC situation, with limited enrollment, only one teacher and concentrated remedial instruction would provide for successful transition





TABLE 3  
 DESCRIPTION OF EXPERIMENTAL AND CONTROL GROUPS  
 SEPTEMBER, 1969  
 EXPERIMENTAL GROUP ( $N_1 = 50$ )  
 CONTROL GROUP ( $N_2 = 92$ )

	Mean		Standard deviations	
	Exp.	Control	Exp.	Control
Chronological Age (months)	161.26	161.55	9.25	8.58
Intelligence Quotient				
(i) Verbal	90.90	87.03	10.02	10.50
(ii) Nonverbal	94.16	90.23	10.26	13.19
Word Meaning	44.22	43.38	9.48	8.99
Paragraph Meaning	45.80	42.47	11.60	10.52
Average Reading	45.22	43.95	9.98	8.91
Spelling	47.54	44.95	14.44	13.27
Language	44.14	38.43	12.42	9.99
Arithmetic Computation	48.52	45.14	11.95	10.78
Arithmetic Concepts	50.30	50.26	9.99	10.45
Arithmetic Applications	48.06	45.91	12.87	10.88
Arithmetic Average	49.02	47.09	9.08	8.97
Test-Battery Average	46.94	44.41	7.65	7.38



to the junior high school program.

Enrollments in SSC were limited to twenty students per class. Major emphasis was placed on reading, spelling, language and arithmetic--primarily because of the students' deficiencies in these areas. Lesser emphasis was placed on courses such as science, social studies, health and music.

Special emphasis was placed on adapting instruction to various levels of student abilities and achievement levels--accomplished largely, by close personal appraisal of the student's learning disability by the teacher and by the use of diagnostic and teacher made tests. This necessitated an array of appropriate textbooks, reference books and other instructional materials at different levels of difficulty and especially fitted to the abilities of the students.

Every effort was made to facilitate learning and to provide for different rates of learning of students. The classroom activities utilized depended upon day to day instructional objectives. Some of these objectives could be attained through whole class presentation, e.g. certain new learnings, in appreciations and multi-sensory presentations such as slides, motion pictures, records, television or radio programs, experiments and demonstrations all of which were used extensively in this program. Other classroom activities required that the



students work in pairs or in teams on various projects such as presenting research reports. Still other objectives could best be attained by the pupil working alone. Individual working activities included independent reading and study for special reports; writing of papers and essays; taking tests for evaluation and analyses of difficulty by the teacher. Also certain types of skills required practise at points of the student's weakness. To this end extensive practise materials were provided. The SSC teacher strived to give the low achievers the kinds of educational experiences that would be of greatest value to them.

Continuous testing was carried out throughout the school year so that both teacher and student could assess progress made. Various diagnostic tests, teacher made tests, and standardized tests such as SAT were used. The Lorge-Thorndike Intelligence Test was used to determine mental ability (Intelligence Quotient) of the students.

Students attending the special segregated classroom full time had all instruction given by one teacher in the core subjects of reading, arithmetic, spelling, and language. Other teachers were allowed to instruct courses such as health, physical education, art and music. However, courses taught by other teachers was held at a minimum, and generally the special class teacher taught all of the subjects to his students.





### Description of the Partially Integrated Classes

Unlike the control group classes where a student was enrolled in and attended a specially segregated classroom full time the partially integrated students were enrolled in regular grade seven classes, and obtained much of their instruction within the regular class. However, these students like those in the specially segregated classroom also required specialized remedial assistance in one or more academic subjects. To receive this specialized remedial instruction they went to the specially segregated class teacher who became in actuality a resource teacher. The instructional techniques, equipment and materials employed by the resource teacher were basically similar to that of the specially segregated classroom which low-achievers attended full time. As in the case of the Carroll study which compared EMR children in segregated versus partially integrated classroom settings "no special treatment was given the subjects other than the actual class placement. No attempt was made to control teacher techniques. . ." (1968, p. 95). Therefore, this aspect of the program will not be repeated in this section.

For some of the students remedial assistance was necessary in most or all of the core subjects of reading, spelling, language and arithmetic. Others required remedial assistance in only one or two of these areas.



The time spent in the resource room varied from less than one hour a day to almost a full day depending upon the student's individual needs. The resource teacher served the children only in those specific ways in which they required help. In this manner the child enjoyed the privilege of attending classes with regular students to the extent permitted by his learning disabilities.

Student-teacher ratio in these partially integrated classes was the same as in the segregated special classes. As in the SSC emphasis was placed on the core subjects of reading, language, spelling and arithmetic. Options were completely taught by regular class teachers.

In addition to the students receiving help in improving academic skills in which they were deficient, the resource class teachers also strived to give the students emotional support and encouragement in their preparation of assignments for the regular grade seven class. If the resource teacher was able to meet these needs, he enabled those students who were capable of doing so to participate more fully in the regular class and at the same time gaining the confidence they so often lacked. A student successfully responding to this program could be completely phased out of the resource room. However, in the vast majority of cases, the student retained contact with the resource room for the duration of the year. For example, if a student was integrated



into a regular grade seven mathematics class he would still come back to the resource room on a regular basis. In this way the resource teacher was always there to help the student should he run into any difficulties. The same was true of the other subjects such as language and spelling.

Thus, the emphasis in the partially integrated classroom setting or resource room was on flexibility of programming. Such flexibility was necessary in order that the program of studies developed for each individual student was of optimal value to him. The student received help in the areas he required it in and when he was in need of it. If he could be successful in a particular subject in a regular class, he was allowed to take that subject.

The time spent by a low-achiever in the regular class was determined by the resource room teacher and the regular teachers. Several factors were taken into consideration in the decision related to the degree of integration-segregation of a student. These included:

1. The age of student.

2. The degree of a student's learning disability.

The student was not to be so significantly different that it was obvious to all that he did not belong in the regular classroom.

3. The emotional stability of the student. A student accepted into the regular classroom was not to





be a disruptive influence in that classroom.

The resource room teacher in conjunction with the regular teachers who taught the low-achievers in regular classrooms maintained constant contact with each other in regards to each student's progress. They evaluated a student's progress on a continual basis throughout the school year. By thus maintaining a close liaison with regards to each student's progress, the regular class programs and the resource room program complemented each other.

In this type of school setting (partially integrated or resource room) the low-achiever became part of the school program rather than apart from it as was the case in the specially segregated class. In addition the teachers involved in this program had to be creative and physically capable of meeting the daily strains and demands of providing this kind of education service.

#### Description of Teachers

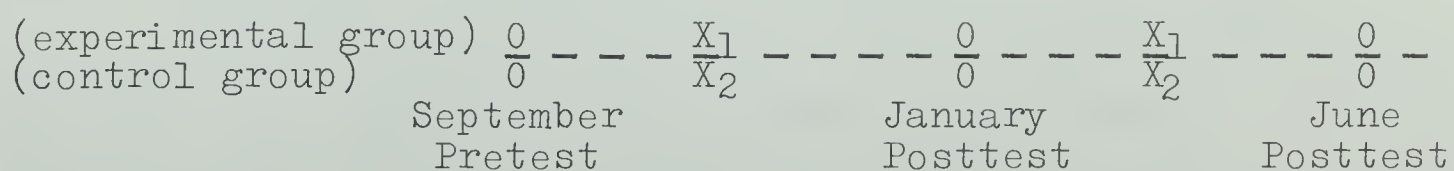
All of the special education teachers at the grade seven level in the Edmonton Separate School System took part in this study. These teachers had at least three years of teacher training. The teachers all had previous experience in teaching low-achievers in special classes. Three of these teachers were assigned to teach in the partially integrated classes and the remaining



seven were assigned to the special segregated classes by the central school administration.

## Research Design

This study was carried out using a population of one hundred and forty-two students previously defined as low-achievers. The subjects were then assigned to the experimental and control groups by the central school administration according to proximity of students to schools with grade seven special education classes. Because these students were not assigned to the experimental and control group randomly in the strict sense of the term, the design of this study falls under what Campbell and Stanely (1963) term "Quasi-Experimental Designs." This particular quasi-experimental design is a modification of their "The Nonequivalent Control Group Design." It may be illustrated diagrammatically as follows.



The dashed line separates the experimental from the control groups. The  $X_1$  represents the treatment of the experimental group and the  $X_2$  represents the treatment of the control group. 0 represents the observations by means of the SAT. As indicated in the diagram three



observations were made during the ten month study: the pretest administered at the beginning of the study; the first posttest administered five months later; and the second posttest administered ten months later at the end of the study. This design differs from the Campbell and Stanely Design by the fact that there are two posttests administered in this study as already indicated. In this manner rate of academic progress might be observed and compared for both groups over two test periods rather than only one.

Although Campbell and Stanely (1963) stress the importance of randomization they feel that this type of a design is well worth using where randomization is not possible. They continue with their appraisal of this design by suggesting that "the more similar the experimental and the control groups are in their recruitment, and the more this similarity is confirmed by scores on the pretest, the more effective this control becomes."

Kerlinger also discusses a similar design which he calls "the Compromise Experimental Group-Control Group Design." He also advises "that the equivalence of the groups should be checked using the means and standard deviations of the pretests: t-tests and F-tests will do" (1967, p. 315). He continues by stating that "although one cannot have the assurance that randomization gives, if these items check one can go ahead with the



study knowing at least that there is not evidence against the equivalence assumption" (1967, p. 315). It is Kerlinger's contention that:

These precautions increase the possibilities of attaining internal validity. Since the groups are "equal" on the dependent variable, one can assume if the differences (D scores) between the pretest and posttest of the experimental group are significantly greater than the differences of the control group, that the discrepancy is explained not by history and maturation, for example, but by the experimental manipulation, X (1967, p. 315).

Lastly, although the investigator did not have control over deciding which classrooms get X, he (as Campbell and Stanely put it) "at least has no reason to suspect differential recruitment related to X"(p. 50).

### Data Collection

Information regarding age, sex and intelligence quotient of the students involved in this study was obtained from the central school administration of the Edmonton Separate School System. The Stanford Intermediate Achievement Test II Partial Battery was employed to determine academic achievement. The battery consisted of the following subtests: word meaning; paragraph meaning; spelling; language; arithmetic computation; arithmetic concepts; and arithmetic applications.





## Description of the Instruments

### The Canadian Lorge-Thorndike Intelligence Test

The authors of the Canadian Lorge-Thorndike Intelligence Tests indicate that these tests are designed to be measures of abstract intelligence. In the test manual they define abstract intelligence as "the ability to work with ideas and the relationships among ideas" (p. 3).

It is a group intelligence test with equivalent forms of verbal and nonverbal batteries. According to Mehrens & Lehmann supposedly, both the verbal and nonverbal batteries measure this same abstract intelligence but do so with a different set of tasks. The two forms of the test enable one to retest individuals whose scores seem questionable for any reason. The authors elaborate on the verbal and nonverbal aspects of the test as follows:

The verbal battery is made up of five subtests which use only verbal items: vocabulary, verbal classification, sentence completion, arithmetic reasoning and verbal analogy. The nonverbal battery uses items which are either pictorial or numerical. It contains three subtests involving pictorial classification, pictorial analogy, and numerical relationships. The tests in this battery yield an estimate of scholastic aptitude not directly dependent upon the ability to read. Use of both the verbal and nonverbal batteries will give maximum data for judging the mental ability of school pupils (1969, p. 3).

In view of the fact that many low-achievers are



poor readers, the nonverbal aspect of the Canadian Lorge-Thorndike Intelligence Test is especially valuable in determining their mental ability.

### The Stanford Intermediate Achievement Test II Partial Battery

The test manual indicates that this achievement test is primarily designed for use from the middle of grade five to the end of grade six. It is printed in a single twenty-four page booklet and includes seven tests. These are the word meaning test and the paragraph meaning test which measure reading. Spelling and language are measured by means of single tests in these two areas. Arithmetic computation, arithmetic concepts and arithmetic applications conclude the test battery.

### Types of Scores

The SAT uses four types of scores (norms). They are grade, age, percentile and stanine. Grade scores were used in this study. The grade scores are converted to grade equivalents by placing a decimal before the last digit, e.g., a score of 87 is converted to 8.17 grade equivalents.

### Norming

Mehrens & Lehamann are of the opinion that "the standardization of the test was excellent" (1969, p. 179). The test manual indicates that "all Stanford Achievement



Test norms are based on the total enrollment in regular classes and each grade level except for a small group markedly atypical as to age" (1969, p. 17). It should be noted that this norming was done on an American population of students. Canadian norms for this test are not available to the investigator's knowledge.

### Validity

The test manual states that the Stanford Achievement Test authors sought to insure content validity "by examining appropriate courses of study and textbooks as a basis for determining the skills, knowledges, understanding, etc. to be measured" (1964, p. 25).

### Reliability

The SAT manual gives the split half reliability coefficients corrected by the Spearman Brown formula and Kuder Richardson estimates. These reliabilities vary from .85 in arithmetic computations to .95 in the language test.

### Test Administration Procedure

The Canadian Lorge-Thorndike Intelligence Test was administered to all the students in this study in September, 1969 by a trained psychologist.

Three forms of the Stanford Intermediate Achievement Test II Partial Battery were administered to the students by their teachers over the ten month period of





the study. Form W (pretest) was administered in September, 1969. Form X the first posttest was administered in January, 1970 and Form Y the second posttest was administered in June, 1970.

The testing program was broken into five sittings. These were:

First Sitting:

Test 1: Word Meaning	12 min.
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Second Sitting:

Test 2: Paragraph Meaning	30 min.
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Test 3: Spelling	15 min.
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Third Sitting:

Test 4: Language	
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Part A: Usage	10 min.
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Part B: Punctuation	7 min.
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Part C: Capitalization	7 min.
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Part D: Dictionary Skills	17 min.
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Part E: Sentence Sense	7 min.
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Fourth Sitting:

Test 5: Arithmetic Computation	35 min.
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Fifth Sitting:

Test 6: Arithmetic Concepts	20 min.
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Test 7: Arithmetic Applications	32 min.
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The total administration time for the partial battery was 178 minutes.



### Treatment of the Data

In this study vigorous controls on the characteristics of the experimental and control groups by randomization could not be employed. In view of this fact the first consideration was to test for significant differences between the groups with respect to mean Intelligence Quotient scores (verbal and nonverbal), mean chronological ages (in months) and mean SAT scores on the September pretest.

The method employed to check the equivalence of the two groups was that suggested by Kerlinger (1967)--the use of the t-test and the F-test. The t-test was used to check for differences between means and the F-test was used to check for differences between variances. These two tests were used to test the hypothesis that:

There are no significant differences between the mean scores and their variances obtained by the students in the special segregated classes (control group) as compared to those students in the partially integrated classes (experimental group) in:

- (1) the September Word Meaning Test
- (2) the September Paragraph Meaning Test
- (3) the September Average Reading
- (4) the September Language Test
- (5) the September Arithmetic Computation Test



- (6) the September Arithmetic Applications Test
- (7) the September Arithmetic Concepts Test
- (8) the September Average of the Arithmetic Tests.
- (9) the September grand mean of the SAT.

Also tested were the hypothesis that the experimental and the control groups did not differ significantly in respect to:

- (1) the chronological ages (in months)
- (2) the verbal IQ (Canadian Lorge-Thorndike Intelligence Test)
- (3) the nonverbal IQ (Canadian Lorge-Thorndike Intelligence Test)

The IBM 360/67 computer was used in this analysis. The computer program employed was ANOV10 entitled "T-tests With Tests on Variances and Welch Approximations." The program was documented by J. Carlson and C. H. Haslett. A brief description of the program as given by the authors follows:

- (1) "t" values (and their probability levels) between two samples are calculated using the formula for "t" tests between independent samples, with or without missing data.
- (2) F ratios (and their probability levels) for the differences between sample variances are given.



- (3) For variables which have unequal variances Welch's approximation to "t" is calculated.
- (4) Correlations are given for the total group if there is no missing data.

Before the t-test could be employed the homogeneity of variances of the experimental and control groups had to be checked. Ferguson explains:

The test for the significance of the difference between means assumes equality of the population variances. Where the assumption of equality of variance is untenable, the ordinary t-test should not be applied (1966, p. 171).

In view of this the F-test was used to check for the differences between variances. In their book Basic Statistical Methods, Downie & Heath point out an important precaution to be taken in reading the F-table when it is employed in testing the homogeneity of variances.

It should be noted that the F test is a one-tailed test, because we are dealing with the part of the F distribution with values greater than 1. When we obtain results that are significant, we say they are significant at the 1 or 5 percent point. If the table is used for a two-tailed test, an F-significant at the .01 level must be interpreted at the .02 level, and F significant at the .05 point at the .10 level (1965, pp. 141 & 142).

For the above stated reasons the .05 level will be referred to as the .10 level and the .01 level will be interpreted at the .02 level in checking for the homogeneity of variances with the F-ratio.

In summary the following procedures were employed





to test the null hypothesis that no significant differences existed between the experimental and control groups in the SAT pretest scores, chronological ages, and IQ scores (verbal and nonverbal).

1. The homogeneity of variances for all of the above variables were checked by the use of the F-test.

2. If there was a significant difference in the homogeneity of variances on any of the above variables the Welch-t test was employed instead of the t-test. The Welch-t makes adjustments for the differences in variances.

3. The t-test was employed to check for differences between means if there were no significant differences between variances.

The F-test data was part of the output of ANOV10. These results are summarized in Table 4. The following abbreviations are used in Table 4:

Variable 1 represents the Word Meaning Test

Variable 2 represents the Paragraph Meaning Test

Variable 3 represents the Average Reading

Variable 4 represents the Spelling Test

Variable 5 represents the Language Test

Variable 6 represents the Arithmetic Computations  
Test

Variable 7 represents the Arithmetic Concepts  
Test



TABLE 4  
F TEST-DIFFERENCES BETWEEN VARIANCES  
SEPTEMBER, 1969  
EXPERIMENTAL GROUP ( $N_1 = 50$ )  
CONTROL GROUP ( $N_2 = 92$ )

Variable	VAR1	VAR2	DF1	DF2	F	CR
1	89.93	80.87	49	91	1.112	1.32
2	134.60	110.68	49	91	1.216	1.43
3	99.57	79.38	49	61	1.254	1.43
4	208.49	175.96	49	91	1.185	1.43
5	154.32	99.90	49	91	1.545	1.43*
6	142.85	116.19	49	91	1.229	1.43
7	99.89	109.26	49	91	1.094	1.43
8	165.54	118.43	49	91	1.398	1.43
9	82.42	80.41	49	91	1.025	1.43
10	58.50	54.53	49	91	1.073	1.43
11	85.55	73.55	49	91	1.163	1.43
12	100.49	110.23	49	91	1.097	1.47
13	105.17	174.00	49	91	1.654	1.47*

\* Indicates a significant difference at the .10 level.



Variable 8 represents the Arithmetic Applications  
Test

Variable 9 represents the Mean of the Arithmetic  
Tests

Variable 10 represents the grand battery mean

Variable 11 represents the chronological ages

Variable 12 represents the verbal IQ

Variable 13 represents the nonverbal IQ

VAR1 represents the variance of the experimental  
group

VAR2 represents the variance of the control  
group

DF1 represents the degrees of freedom of the  
experimental group

DF2 represents the degrees of freedom of the  
control group

F represents the computed F-ratios

CR represents the critical regions

Inspection of the F-ratios and the Critical  
Regions in Table 4 shows that there are significant  
differences between variances at the .10 level for the  
reading test (variable 5) and for the nonverbal section  
(variable 13) of the Lorge-Thorndike Intelligence Test.  
There is homogeneity of variances for the remaining  
variables.

According to Ferguson "approximate methods





for use where the variances are unequal have been suggested by Cochran and Cox (1950) and by Welch (1938)" (1966, p. 171). The method proposed by Welch was part of the output data of ANOV10. Ferguson states that the "method proposed by Welch makes an adjustment in the number of degrees of freedom" (1966, p. 171).

The data for Welch T Prime Approximation on variables is given in Table 5. In addition to the abbreviations used in Table 4 is the abbreviation T Prime which represents the Welch T.

Using the Welch T-Prime approximation to compare the mean scores of the language test and the nonverbal IQ tests, the following conclusions were drawn by the investigator.

1. The language test with 83.95 degrees of freedom on the Welch-T has a T-Prime of 2.79. The critical region at the .05 level of significance is approximately 2.00. Since the Welch-T value of 2.79 is greaser than 2.00 the differences between the mean scores of the experimental and control groups would be considered to be significant.

2. The nonverbal IQ test with 123.13 degrees of freedom on the Welch-T has a T-Prime of 1.97. The critical region at the .05 level of significance is approximately 1.98. Since the Welch T value of 1.97 is slightly smaller than 1.98 the difference between the mean scores of the experimental and control groups



TABLE 5  
WELCH T PRIME APPROXIMATION ON VARIABLES  
SEPTEMBER, 1969

Variable	D.F.	T Prime	C.R.
Language	83.95	2.79	2.00*
Nonverbal IQ	123.13	1.97	1.98

\* Indicates a significant difference at the .05 level.



in the nonverbal IQ test would not be considered to be significant.

The remaining variables were analyzed for significant differences on the mean scores of the pretest by using the t-test. The data for the t-tests are given in Table 6. The following abbreviations are used in Table 6:

XBAR1--represents the means scores of the experimental group.

XBAR2--represents the mean scores of the control group.

SDEV1--represents the standard deviations of the experimental group.

SDEV2--represents the standard deviations of the control group.

Examination of Table 5 shows that the mean scores of all the variables are not significantly different with the exception of the verbal IQ. The verbal IQ mean scores are significantly different in favor of the experimental group at the .05 level.

In summary the final conclusions drawn from comparing the means of the thirteen variables by the use of t-tests and the Welch T-Prime test are as follows:

1. Significant differences in favor of the experimental group on the language test of the SAT and the verbal IQ of the Lorge-Thorndike Intelligence



TABLE 6

## T. TESTS

SEPTEMBER, 1969

EXPERIMENTAL GROUP (N = 50)

CONTROL GROUP (N = 92).

Variable	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	C.R.
Word Meaning	44.22	43.38	9.48	8.99	140	0.518	1.980
Paragraph Meaning	45.80	42.47	11.60	10.52	140	1.726	1.980
Average Reading	45.22	43.16	9.98	8.91	140	1.250	1.980
Spelling	47.54	44.95	14.44	13.27	140	1.071	1.980
Arithmetic Computation	48.52	45.14	11.95	10.78	140	1.704	1.980
Arithmetic Concepts	50.30	50.26	9.99	10.45	140	0.021	1.980
Arithmetic Applications	48.06	45.91	12.87	10.88	140	1.044	1.980
Arithmetic Average	49.02	47.09	9.08	8.97	140	1.213	1.980
Test-Battery Average	46.94	44.41	7.65	7.38	140	1.910	1.980
Chronological Age	161.26	161.55	9.25	8.58	140	0.189	1.980
Verbal IQ	90.90	87.03	10.02	10.50	140	2.115	1.980*

\* Indicates a significant difference at the .05 level.





Test.

2. No significant differences were found on the mean scores of the remaining eleven variables.

Since there were differences between the group mean scores (significant in the language test) in favor of the experimental group and since it was desirable to remove this initial bias statistically the main Null Hypotheses on pages two and three of this study were tested by carrying out a one-way analysis of covariance. The covariant was comprised of the September Stanford Achievement Test scores and the criterion was comprised of two different forms of the SAT. The first posttest was administered five months after the beginning of the study and a second posttest was administered in June, 10 months after the beginning of the study. A one way analysis of covariance was performed comparing the September to January achievement results and a second one way analysis of covariance was done comparing the September to June achievement test results. In this manner possible trends developing with respect to achievement under the two conditions could be observed.

To further aid in observation of these trends the mean gains of the two groups were portrayed graphically over the 10 month period.

Finally a t-test entitled 'Correlated "t" tests' (ANOV12) was employed to determine whether or not



significant gains had been made by both groups over the ten month experimental period. The authors of ANOV12 indicate that "this program tests for the significance of the difference between means and between variances for correlated samples."



## Chapter IV

### Analyses of Data and Summary of Findings

This chapter analyzes the data from the testing of 50 low achieving pupils placed in PIC with 92 low achieving pupils placed in SSC at the grade seven level. Three statistical analyses have been carried out on each achievement variable as measured by the SAT. These include:

1. A one-way analysis of covariance was carried out five months after the study began. It encompassed a statistical comparison on each variable of the SAT Form W pretest with the equivalent Form X administered in January.

2. A one-way analysis of covariance was carried out ten months after the study began. It encompassed a statistical comparison on each variable of the SAT Form W pretest with the equivalent Form Y administered in June, at the end of the experimental period.

3. A correlated t-test was employed to determine whether significant achievement gains had been made by both groups at the end of the experimental period.

In addition to the statistical analysis is a graphic portrayal of the experimental and control groups' rate of academic progress on each variable over the ten month study. The purpose of this section was to help determine whether any trends were developing between the





two groups.

To indicate a significant difference in achievement between the experimental group (PIC) and the control group (SSC) with 1 and 139 degrees of freedom an F-value of 3.92 at the .05 level and an F-value of 6.85 at the .01 level of confidence was required. These stated F values apply throughout the testing of all of the null hypotheses and therefore will not be repeated in this chapter.

### Hypothesis 1 and Results

That there is no significant difference ( $P < .05$ ) in academic achievement test results between the partially integrated class group as compared to the special segregated class group in the following subtests of the SAT:

- a. Word Meaning
- b. Paragraph Meaning
- c. Spelling
- d. Arithmetic Computations
- e. Arithmetic Concepts
- f. Arithmetic Applications

### Word Meaning

The statistical analysis of the Stanford Achievement Word Meaning Test scores between the PIC as compared to the SSC group is shown in Table 7. The adjusted F-ratio of 5.00 indicates a significant difference at the .05



TABLE 7

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL AND EXPERIMENTAL GROUPS  
FOR THE STANFORD ACHIEVEMENT WORD MEANING TEST

Time Period	<u>Unadjusted Means</u>		<u>Adjusted Analysis of Variance</u>							
	Control N=92	Exp. N=50	<u>Adjusted Means</u>		Source	DF	MS	Adjusted	F	Prob.
Sept. to Jan.	50.68	54.92	50.91	54.50	Group	1	418.71	5.00		.027*
					Within	139	83.64			
Sept. to June	53.93	60.16	53.87	60.26	Group	1	1255.31	11.64		.001**
					Within	139	150.83			

\* Significant at the .05 level

\*\* Significant at the .01 level



level in favor of the experimental group five months after the study was in progress. An adjusted F-ratio of 11.6 indicates a significant difference at the .01 level in favor of the experimental group on the second posttest administered in June.

Figure 1 illustrates the development of Word Meaning skills over a ten month period. There is an initial difference of .1 of a grade equivalent in favor of the experimental group on the pretest. This gap increased to .3 of a grade equivalent after five months and to .7 of a grade equivalent in favor of the experimental group at the conclusion of the study. As indicated by the graph both groups appear to have slowed down in their rate of progress after the first five months. This slow down was slightly greater for the control group than for the experimental group.

#### Paragraph Meaning

The statistical analysis of the Stanford Achievement paragraph meaning test scores between the experimental and control groups is shown in Table 8. The adjusted F-ratio of 7.56 indicates a significant difference at the .01 level in favor of the experimental group after five months. An adjusted F-ratio of 8.41 indicates a significant difference at the .01 level in favor of the experimental group at the end of the study.

Figure 2 illustrates the development of Paragraph



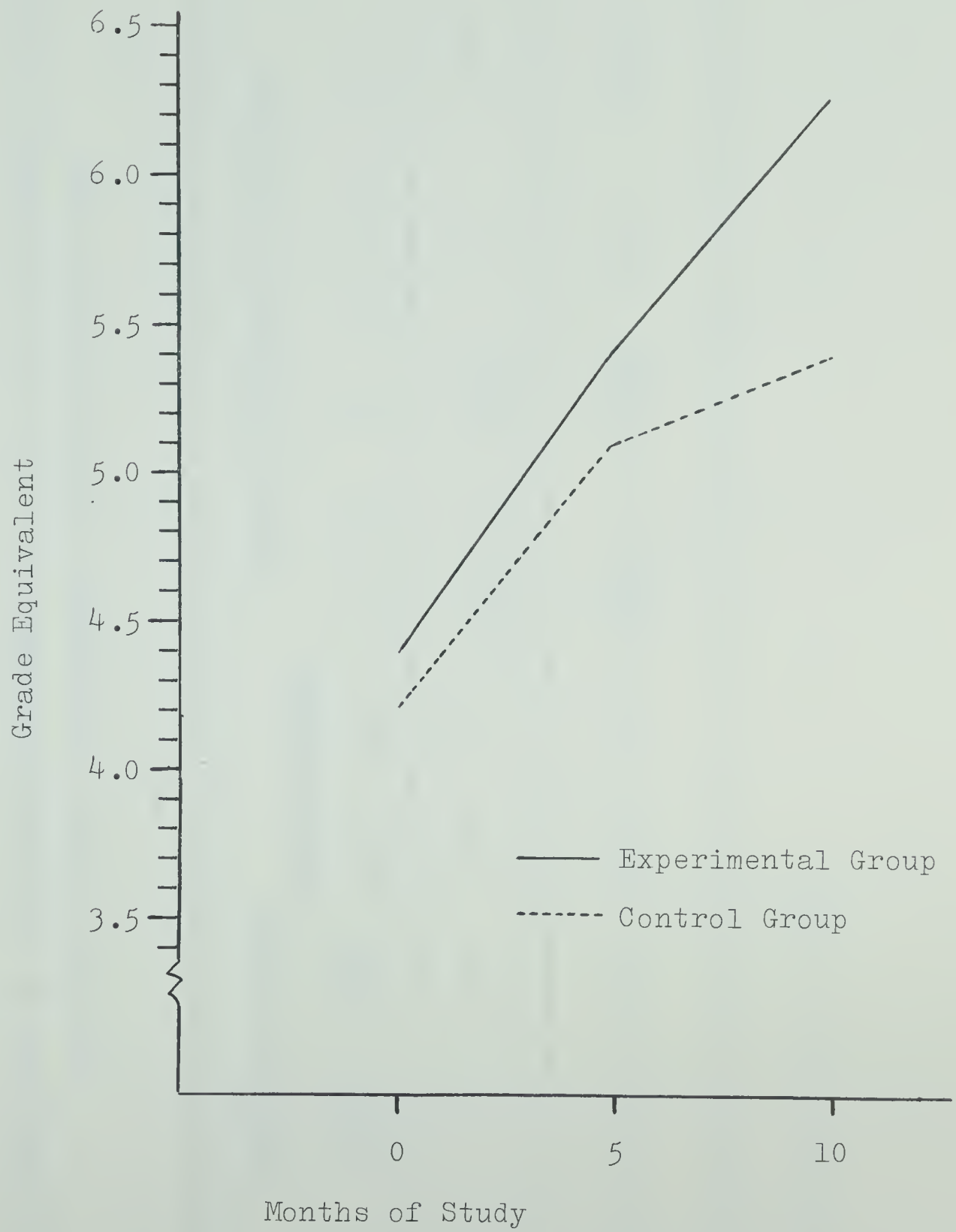


FIGURE 1

DEVELOPMENT OF WORD MEANING SKILLS OVER A TEN MONTH PERIOD





TABLE 8

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL AND EXPERIMENTAL GROUPS  
FOR THE STANFORD ACHIEVEMENT PARAGRAPH MEANING TEST

Time Period	<u>Unadjusted Means</u>		<u>Adjusted Means</u>		<u>Adjusted Analysis of Variance</u>				
	Control N=92	Exp. N=50	Control	Exp.	Source	DF	MS	Adjusted F	Prob.
Sept. to Jan.	47.00	53.54	47.78	52.10	Group	1	593.85	7.56	.007**
					Within	139	78.16		
Sept. to June	51.41	57.68	51.76	57.04	Group	1	897.48	8.41	.004**
					Within	139	106.67		

\*\* Significant at the .01 level



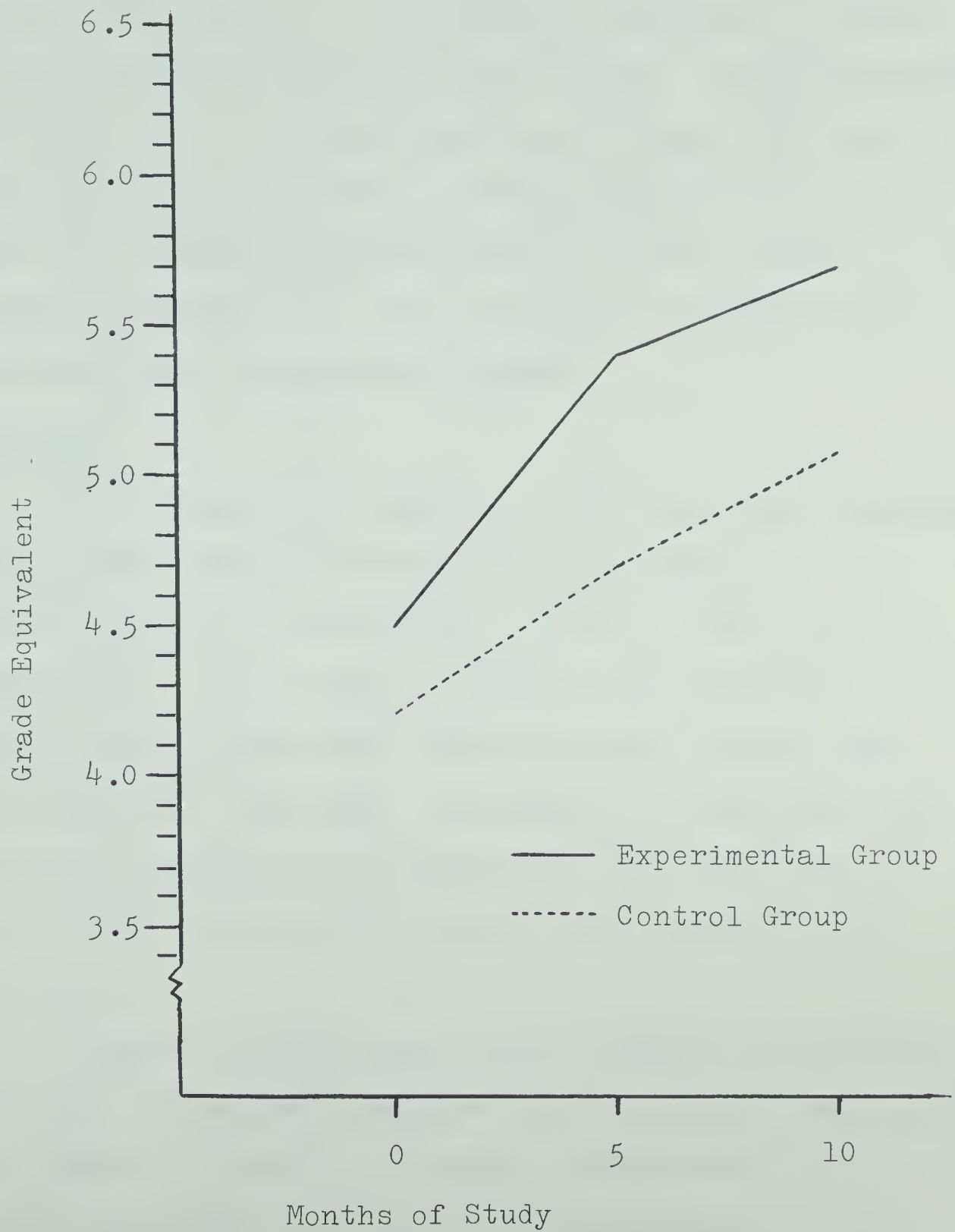


FIGURE 2

DEVELOPMENT OF PARAGRAPH MEANING SKILLS OVER A TEN MONTH PERIOD



Meaning skills over a ten month period. There is an initial difference of .4 of a grade equivalent in favor of the experimental group on the pretest. This difference increases to .7 of a grade equivalent after five months and stays at .7 of a grade equivalent after ten months. After five months the graph reveals a slight decline in rate of progress for both groups with decline being more severe for experimental group.

### Spelling

The statistical analysis of the Stanford Achievement Spelling test scores between the experimental and the control groups is illustrated in Table 9. The adjusted F-ratio of 11.74 indicates a significant difference at the .01 level in favor of the experimental group after five months of the study. An adjusted F-ratio of 7.63 indicates a significant difference at the .01 level in favor of the experimental group at the conclusion of the study.

Figure 3 illustrates the development of Spelling skills for the experimental and control groups over a ten month period. There is an initial difference of .3 of a grade equivalent in favor of the experimental group. After five months this difference is increased to .8 of a grade equivalent in favor of the experimental group and drops to .7 of a grade equivalent after ten months. The experimental group slows in its rate of progress after





TABLE 9

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL AND EXPERIMENTAL GROUPS  
FOR THE STANFORD ACHIEVEMENT SPELLING TEST

Time Period	<u>Unadjusted Means</u>		<u>Adjusted Means</u>		<u>Adjusted Analysis of Variance</u>			
	Control N=92	Exp. N=50	Control	Exp.	Source	DF	MS	Adjusted F Prob.
Sept. to Jan.	50.18	58.14	51.23	56.75	Group	1	978.04	11.74 .001**
					Within	139	83.30	
Sept. to June	55.05	61.90	55.92	60.31	Group	1	617.60	7.63 .007**
					Within	139	80.94	

\*\* Significant at the .01 level



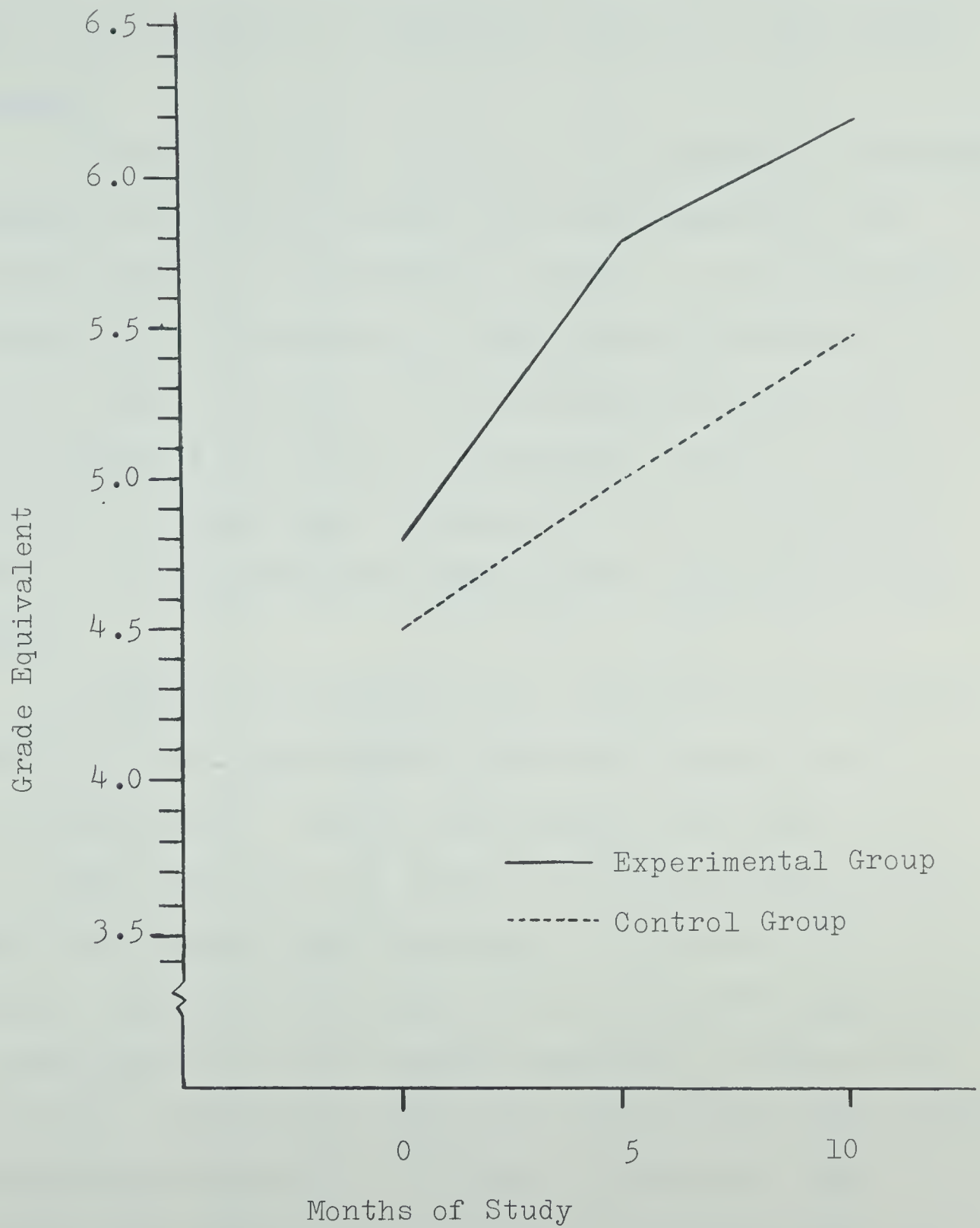


FIGURE 3

DEVELOPMENT OF SPELLING SKILLS OVER A TEN MONTH PERIOD



the first five months whereas the control group maintains about the same rate of progress to the end of the study.

### Language

The statistical analysis of the Stanford Achievement Language test scores between the experimental and the control groups is illustrated in Table 10. The adjusted F-ratio of 14.59 indicates a significant difference at the .01 level in favor of the experimental group after five months of the study. An adjusted F-ratio of 7.42 indicates a significant difference at the .01 level in favor of the experimental group at the conclusion of the study.

Figure 4 illustrates the development of Language skills for the experimental and control groups over a ten month period. There is an initial difference of .6 of a grade equivalent in favor of the experimental group. After five months this difference is increased to .9 of a grade equivalent in favor of the experimental group and is maintained at .9 of a grade equivalent to the end of the study. After five months the experimental group shows a very slight decline in its rate of progress. The control group shows a greater rate of progress after the first five months.

### Arithmetic Computations

The statistical analysis of the Stanford Achievement Arithmetic Computations Test scores between the



TABLE 10

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL AND EXPERIMENTAL GROUPS  
FOR THE STANFORD ACHIEVEMENT LANGUAGE TEST

Time Period	<u>Unadjusted Means</u>		<u>Adjusted Analysis of Variance</u>			
	<u>Adjusted Means</u>		Source	DF	MS	Adjusted F Prob.
	Control N=92	Exp. N=50				
Sept. to Jan.	41.73	51.30	Group	1	106.42	14.59 .000**
			Within	139	72.93	
Sept. to June	48.04	56.98	Group	1	771.90	7.42 .007**
			Within	139	104.04	

\*\* Significant at the .01 level





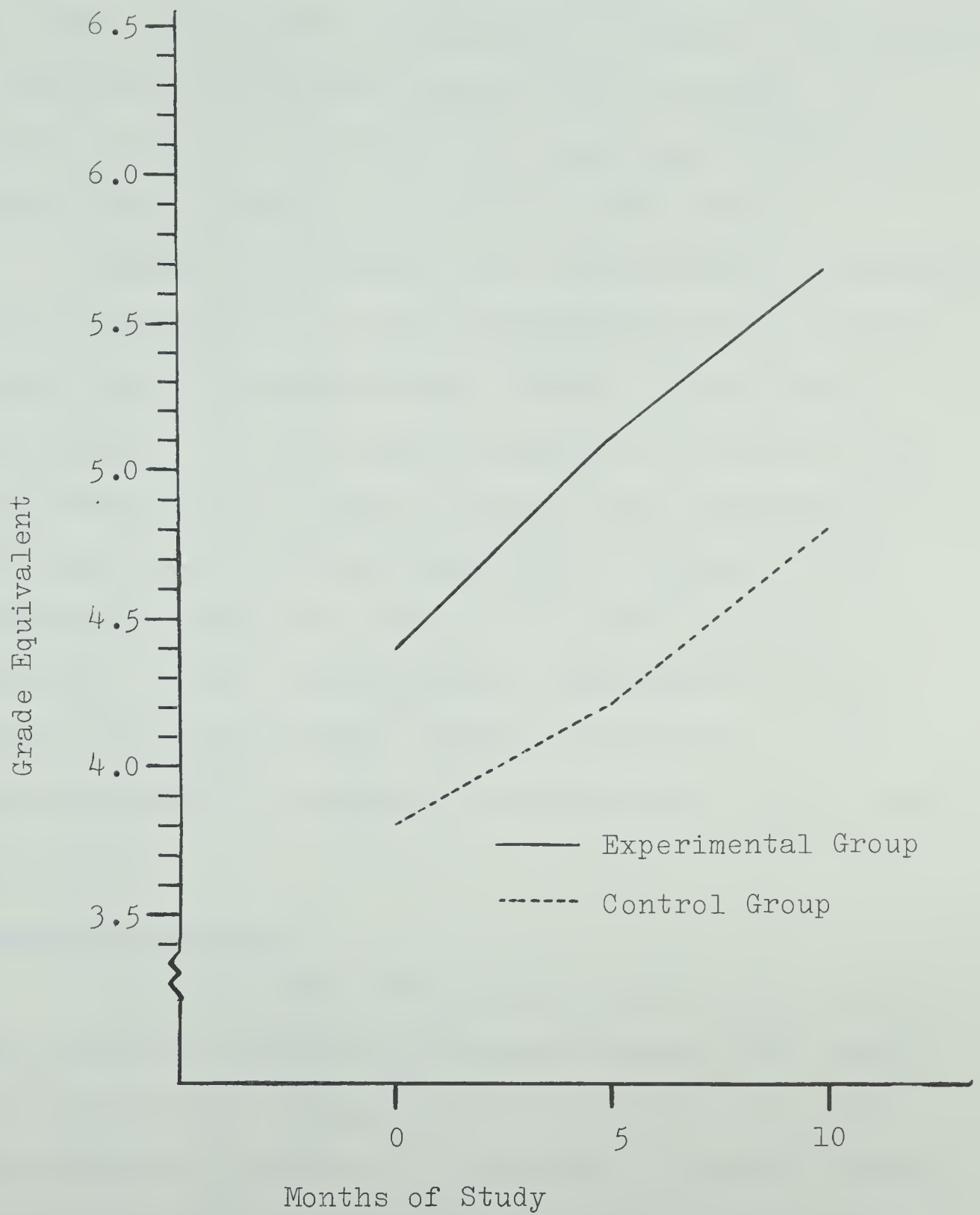


FIGURE 4

DEVELOPMENT OF LANGUAGE SKILLS OVER A TEN MONTH PERIOD



experimental and the control groups is shown in Table 11. After five months the adjusted F-ratio of .92 indicates no significant difference between the two groups. An adjusted F-ratio of .29 shows no significant difference between the two groups at the end of the study.

Figure 5 illustrates the development of Arithmetic Computations skills for the experimental and the control groups over a ten month period. There is an initial difference of .3 of a grade equivalent in favor of the experimental group. After 5 months this difference is increased to .4 of a grade equivalent in favor of the experimental group and drops to 0 at the conclusion of the study. After five months the experimental group's rate of progress declined markedly whereas the control group continued to progress at the same rate as the first five months.

#### Arithmetic Concepts

The statistical analysis of the Stanford Achievement Arithmetic Concepts test scores between the experimental and control groups is shown in Table 12. After five months the study was in progress an adjusted F-ratio of 4.8 indicates a significant difference in favor of the experimental group at the .01 level of significance. An adjusted F-ratio of 8.7 indicates a significant difference at the .01 level of significance in favor of the experimental group at the end of the study.



TABLE 11

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL AND EXPERIMENTAL GROUPS  
FOR THE STANFORD ACHIEVEMENT ARITHMETIC COMPUTATIONS TEST

Time Period	<u>Unadjusted Means</u>		<u>Adjusted Analysis of Variance</u>				
	Control N=92	Exp. N=50	<u>Adjusted Means</u>		Source	DF	MS
			Control	Exp.			
Sept. to Jan.	51.24	54.50	51.95	53.20	Group	1	49.78
					Within	139	54.31
							.92
							.340
Sept. to June	57.12	57.00	57.40	56.48	Group	1	272.77
					Within	139	95.14
							.28
							.593





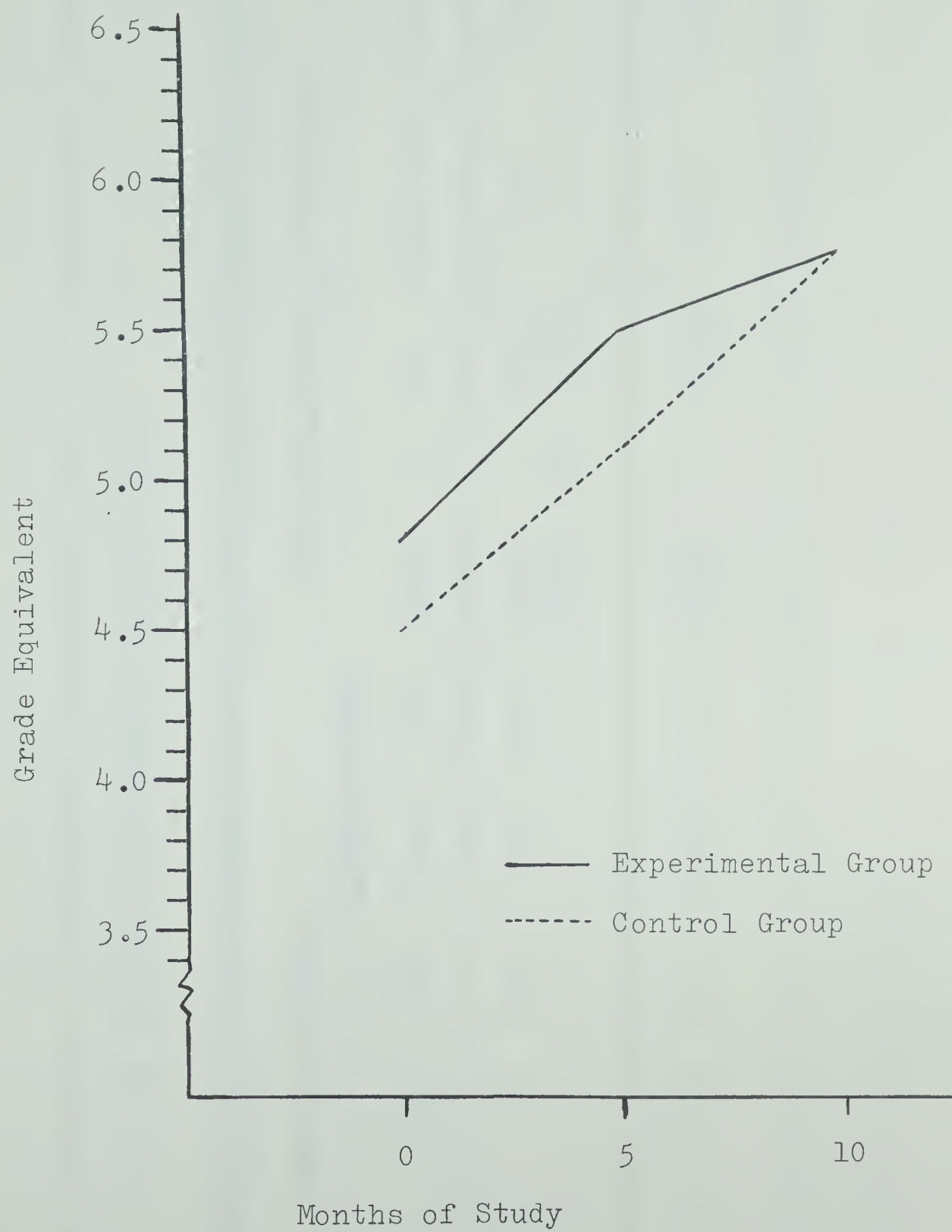


FIGURE 5

DEVELOPMENT OF ARITHMETIC COMPUTATIONS SKILLS OVER A TEN  
MONTH PERIOD



TABLE 12

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL AND EXPERIMENTAL GROUPS  
FOR THE STANFORD ACHIEVEMENT CONCEPTS TESTS

Time Period	<u>Unadjusted Means</u>		<u>Adjusted Means</u>		<u>Adjusted Analysis of Variance</u>		
	Control N=92	Exp. N=50	Control	Exp.	Source	DF	MS
Sept. to Jan.	53.59	57.08	53.58	57.09	Group	1	398.31
					Within	139	82.60
							4.8
							.030*
Sept. to June	57.98	63.10	57.99	63.08	Group	1	842.50
					Within	139	96.81
							8.7
							.004**

\* Significant at the .05 level

\*\* Significant at the .01 level



Figure 6 illustrates the development of Arithmetic Concepts skills over a ten month period for the experimental and the control groups. There is no substantial difference between the initial scores of the experimental and control groups. Five months later there is a difference of .3 grade equivalents and after ten months this difference is increased to .5 of a grade equivalent in favor of the experimental group.

#### Arithmetic Applications

Table 13 shows the statistical analysis of the Stanford Achievement Arithmetic Applications test. After five months the adjusted F-ratio of 11.6 indicates a significant difference at the .01 level in favor of the experimental group. The adjusted F-ratio of 3.8 indicates no significant difference on the Arithmetic Applications test between the experimental and control groups at the conclusion of the study.

Figure 7 illustrates the development of Arithmetic Application skills for the experimental and control groups over a ten month period. There is an initial difference of .2 of a grade equivalent in favor of the experimental group. After five months this difference is increased to .6 of a grade equivalent in favor of the experimental group and drops to .5 of a grade equivalent at the termination of the study. It is interesting to note that after the first five months of the study



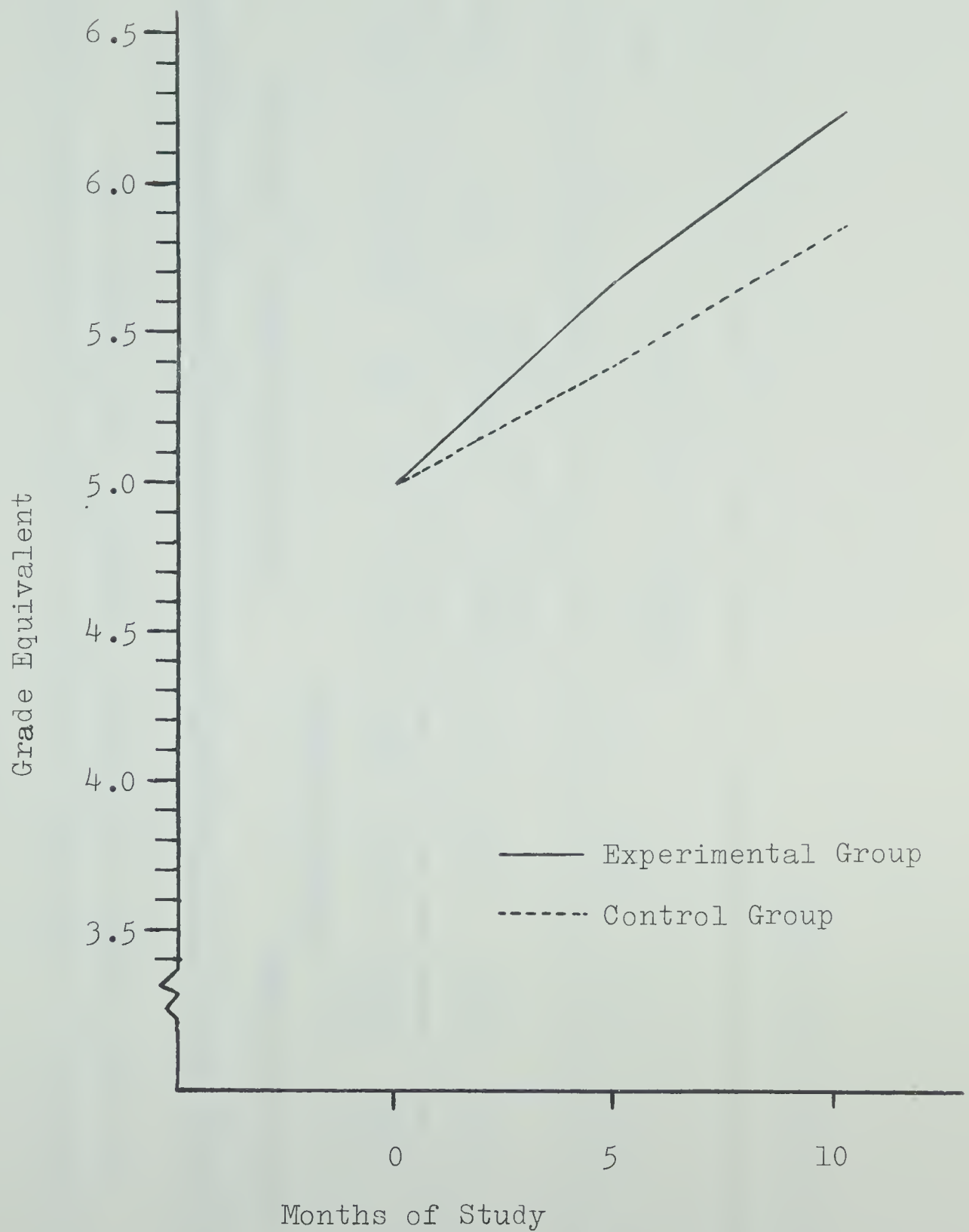


FIGURE 6

DEVELOPMENT OF ARITHMETIC CONCEPTS SKILLS OVER A TEN MONTH PERIOD





TABLE 13

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL AND EXPERIMENTAL GROUPS  
FOR THE STANFORD ACHIEVEMENT ARITHMETIC APPLICATIONS TEST

Time Period	<u>Unadjusted Means</u>		<u>Adjusted Means</u>		<u>Adjusted Analysis of Variance</u>			
	Control N=92	Exp. N=50	Control	Exp.	Source	DF	MS	Adjusted F Prob.
Sept. to Jan.	49.97	56.97	50.44	55.62	Group	1	861.88	11.6 .001**
					Within	139	74.37	
Sept. to June	56.02	61.28	56.69	60.04	Group	1	359.43	3.8 .053
					Within	139	94.20	

\*\* Significant at the .01 level



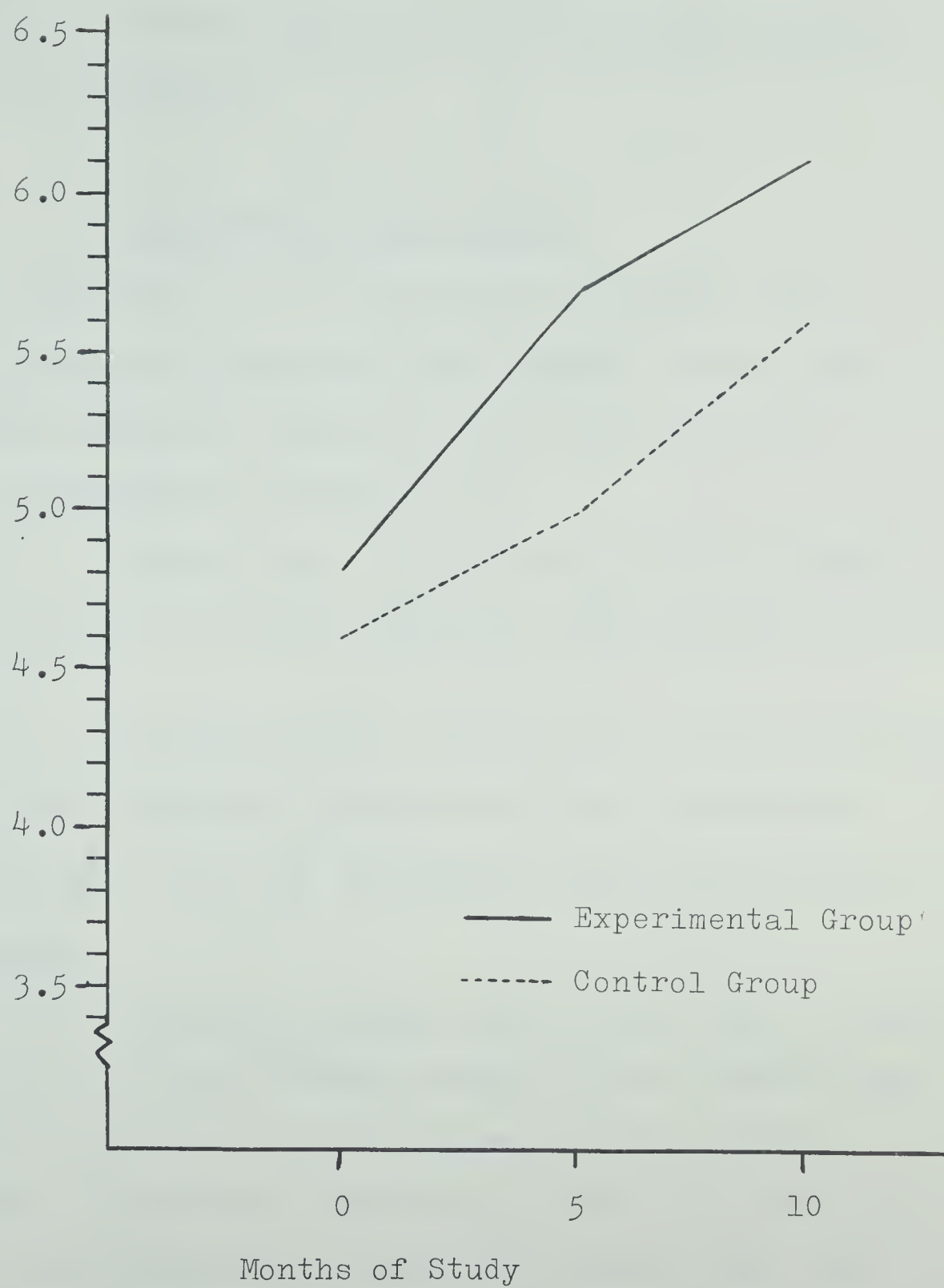


FIGURE 7

DEVELOPMENT OF ARITHMETIC APPLICATIONS SKILLS OVER A  
TEN MONTH PERIOD



the experimental group appears to be on the decline in its rate of progress whereas the control group appears to be on the upswing.

### Hypothesis 2 and Results

That there is no significant difference ( $P < .05$ ) in academic achievement test results between the partially integrated class group as compared to the special segregated class group in:

a. Reading Mean. (This score is the arithmetic mean of the Word Meaning scores and the Paragraph Meaning scores.)

b. Arithmetic Mean. (This score is the arithmetic mean of the Arithmetic Computation scores, Arithmetic Concepts scores, and the Arithmetic Applications scores.)

#### Reading Mean

The statistical comparison of achievement between the control and experimental groups for the Reading Mean is shown in Table 14. The adjusted F-ratio of 8.11 indicates a significant difference at the .01 level in favor of the experimental group five months after the study began. An adjusted F-ratio of 6.90 indicates a significant difference at the .01 level in favor of the experimental group on the second posttest administered in June.





TABLE 14

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL AND EXPERIMENTAL GROUPS  
FOR THE STANFORD ACHIEVEMENT TEST READING MEAN

Time Period	<u>Unadjusted Means</u>		<u>Adjusted Means</u>		<u>Adjusted Analysis of Variance</u>				
	Control N=92	Exp. N=50	Control	Exp.	Source	DF	MS	Adjusted F	Prob.
Sept. to Jan.	49.07	54.42	49.64	53.36	Group	1	444.28	8.11	.005**
					Within	139	54.76		
Sept. to June	53.97	59.16	54.55	58.09	Group	1	401.55	6.90	.010**
					Within	139	58.17		

\*\* Significant at the .01 level



Figure 8 illustrates the development of the Mean Reading scores over a ten month period. Initially there was a spread of .2 grade equivalent in favor of the experimental group. This spread increased to .5 grade equivalent after five months of the study and stayed at this level at the end of the study. Both groups showed a decline in rate of progress in the reading means after the first five months of the study.

#### Arithmetic Mean

The statistical comparison of achievement between the experimental and control groups for the Arithmetic Mean is shown in Table 15. The adjusted F-ratio of 8.4 indicates a significant difference at the .01 level in favor of the experimental group five months after the study began. An adjusted F-ratio of 1.3 indicates no significant difference between the two groups at the conclusion of the study.

Figure 9 illustrates the development of the Arithmetic Mean scores over a ten month period. The initial difference in favor of the experimental group is .2 grade equivalent. Five months later this difference increased to .4 of a grade equivalent. The study is concluded with .3 of a grade equivalent separating the two groups in favor of the experimental group. The graph indicates a slight decline in rate of progress for the experimental group. The control group on the



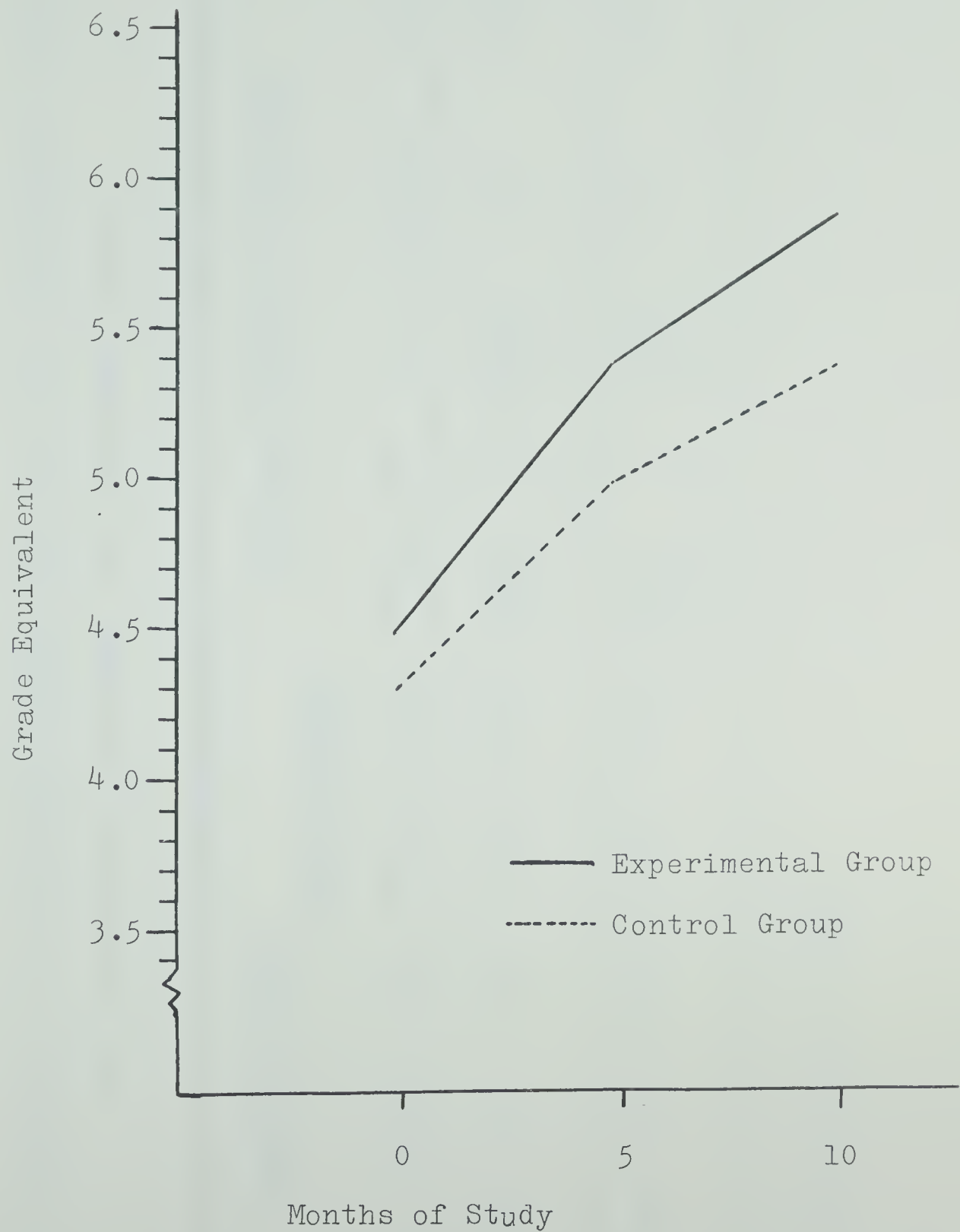


FIGURE 8

DEVELOPMENT OF AVERAGE READING SKILLS OVER A TEN MONTH PERIOD



TABLE 15

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL AND EXPERIMENTAL GROUPS  
FOR THE STANFORD ACHIEVEMENT TEST ARITHMETIC MEAN

Time Period	<u>Unadjusted Means</u>		<u>Adjusted Means</u>		<u>Adjusted Analysis of Variance</u>			
	Control	Exp.	Control	Exp.	Source	DF	MS	Adjusted F Prob.
Sept. to Jan.	51.57	55.98	52.06	55.08	Group	1	292.36	8.4 .004**
					Within	139	34.61	
Sept. to June	57.32	60.46	57.95	59.31	Group	1	59.22	1.3 .255
					Within	139	45.32	

\*\* Significant at the .01 level





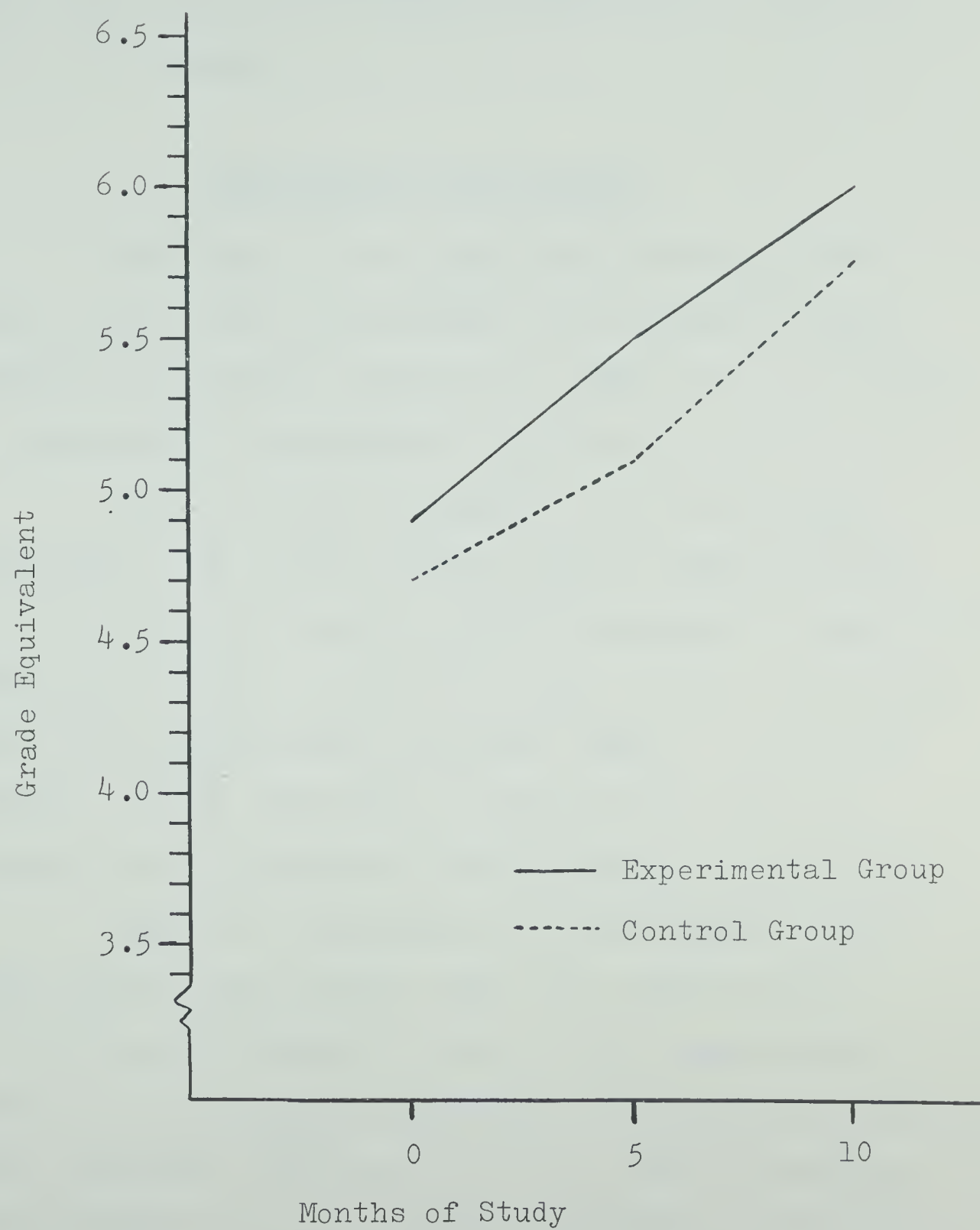


FIGURE 9

DEVELOPMENT OF ARITHMETIC MEAN SCORES OVER A TEN MONTH PERIOD



other hand shows an increase in the rate of progress after five months.

### Hypothesis 3 and Results

That there is no significant difference ( $P < .05$ ) in the overall achievement test battery average between the partially integrated class group as compared to the specially segregated class group.

The statistical comparison of the Stanford Achievement Test Grand Battery Mean is shown in Table 16. The adjusted F-ratio of 17.17 indicates a significant difference at the .01 level in favor of the experimental group five months after the study began. An adjusted F-ratio of 2.01 indicates no significant difference between the two groups at the conclusion of the study.

Figure 10 illustrates the development of the Grand Battery Mean scores over a ten month period. The initial difference in favor of the experimental group is .3 of a grade equivalent. Five months later this difference increased to .6 of a grade equivalent and decreased to .4 of a grade equivalent at the end of the study. The experimental group's rate of progress tended to decline after five months whereas the control group's rate of progress appears to be on the upswing.



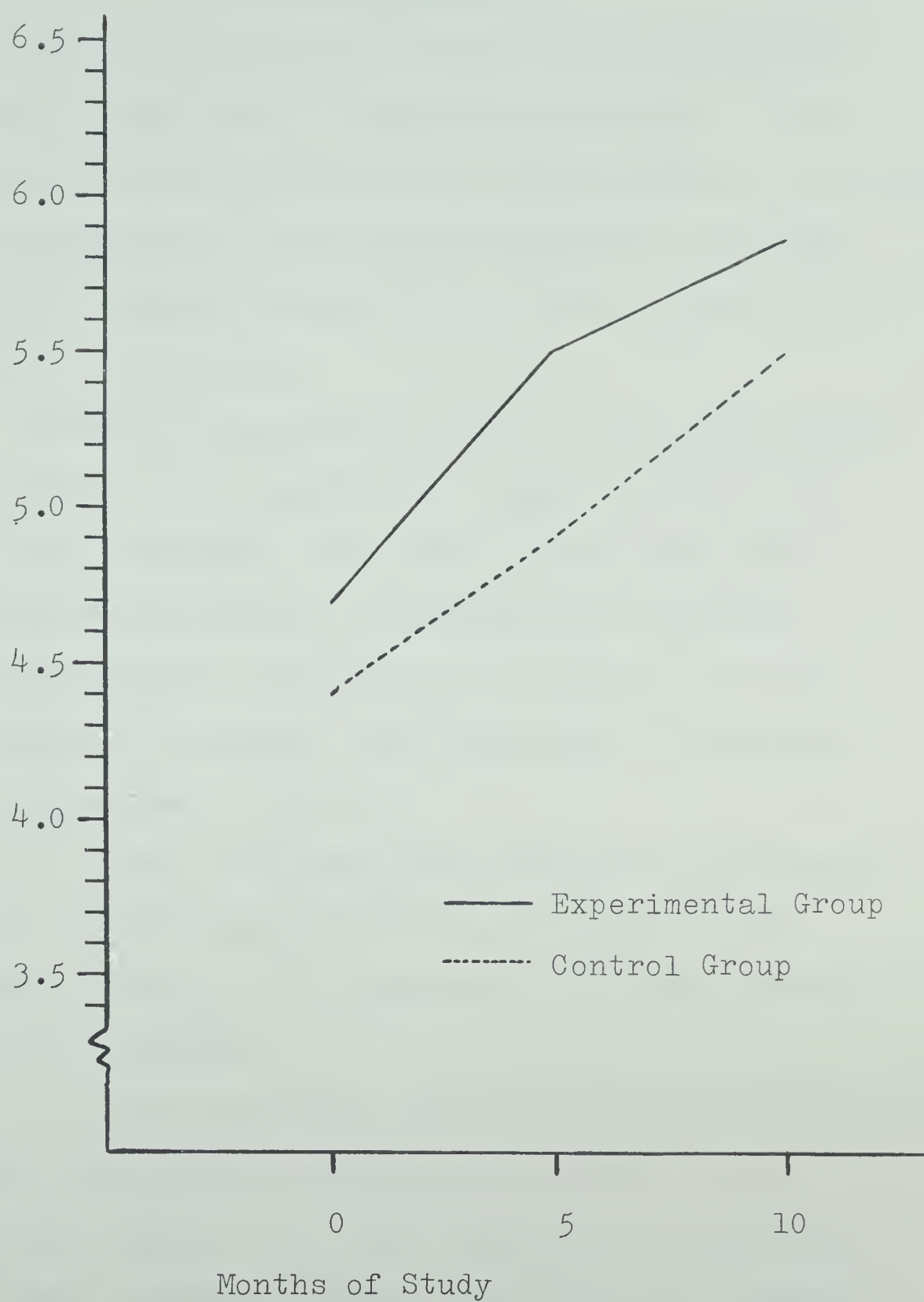


FIGURE 10

DEVELOPMENT OF GRAND BATTERY MEAN OVER A TEN MONTH PERIOD



### Summary of Findings

To avoid differences between the experimental and control groups due to chance the treatment of data in testing, the null hypotheses in this study was considered to be statistically significant between the two means only if the F-ratio attained the critical value at the .05 level of confidence.

To make a comparative study of the achievement of the pupils in the experimental and control groups each of the hypotheses was tested twice--once after five months the study was in progress and secondly after ten months the study was in progress or at the termination of the study. The findings of this study may be summarized as follows:

1. After five months the study was in progress there were significant differences in favor of the experimental group on all variables of the SAT except Arithmetic Computation.

2. After ten months the study was in progress there were significant differences in favor of the experimental group in the Word Meaning test, Paragraph Meaning test, Average Reading, Spelling test, Language test and Arithmetic Concepts test. There were no significant differences in the Arithmetic Computations test, Arithmetic Applications test, Arithmetic Mean, nor in the Grand Battery Mean.





Finally, as the probabilities in Table 16 indicate both groups made significant gains in their achievement scores over the ten month period.



TABLE 16

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL AND EXPERIMENTAL GROUPS  
FOR THE GRAND BATTERY MEAN OF THE STANFORD ACHIEVEMENT TEST

<u>Unadjusted Means</u>		<u>Adjusted Analysis of Variance</u>			
Time Period	<u>Adjusted Means</u>		Source	DF	MS
	Control N=92	Exp. N=50			
Sept. to Jan.	49.30	55.16	Group	1	444.08
			Within	139	25.86
					17.17
					.000**
Sept. to June	54.67	58.78	Group	1	91.34
			Within	139	45.48
					2.01
					.159

\*\* Significant at the .01 level



TABLE 17  
CORRELATED "t" TESTS  
EXPERIMENTAL GROUP (DF=49)  
CONTROL GROUP (DF=91)

Variable	<u>t-value</u>		<u>Probability</u>	
	Exp.	Control	Exp.	Control
Word Meaning	13.117	11.499	0.000	0.000
Paragraph Meaning	9.664	8.708	0.000	0.000
Average Reading	13.942	12.724	0.000	0.000
Spelling	11.765	10.289	0.000	0.000
Language	8.057	8.625	0.000	0.000
Arithmetic Computation	6.322	11.780	0.000	0.000
Arithmetic Concepts	8.546	6.812	0.000	0.000
Arithmetic Applications	9.230	9.815	0.000	0.000
Arithmetic Mean	13.295	13.410	0.000	0.000
Grand Battery Mean	20.415	10.312	0.000	0.000



## Chapter V

Conclusions, Implications, Limitations and Recommendations  
For Further Study

The purpose of this study was to compare two types of classroom grouping for low-achievers who completed elementary school but who appeared unable to cope with a regular junior high school program on a full time basis. One group of low-achievers attended specially segregated classes full time and a second group of low-achievers were partially integrated into the regular grade seven program of studies. The two groups were compared for gains in academic achievement as measured by the Stanford Intermediate Achievement Test II Partial Battery.

Conclusions and Implications

Examination of the critical F-ratios on Tables 7 to 12 led the investigator to make the following decisions in regards to hypothesis 1.

<u>After Five Months of Study</u>	<u>After Ten Months of Study</u>
1a $H_0$ was rejected	1a $H_0$ was rejected
1b $H_0$ was rejected	1b $H_0$ was rejected
1c $H_0$ was rejected	1c $H_0$ was rejected
1d $H_0$ was not rejected	1d $H_0$ was not rejected
1e $H_0$ was rejected	1e $H_0$ was rejected





If  $H_0$  was rejected

If  $H_0$  was not rejected

Examination of the critical F-ratios on Tables 13 and 14 led the investigator to make the following decisions in regards to hypothesis 2.

After Five Months of Study

After Ten Months of Study

2a  $H_0$  was rejected

2a  $H_0$  was rejected

2b  $H_0$  was rejected

2b  $H_0$  was not rejected

Examination of the critical F-ratios on Tables 15 and 16 led the investigator to make the following decisions in regards to hypothesis 3.

After Five Months of Study

After Ten Months of Study

3  $H_0$  was rejected

3  $H_0$  was not rejected

It is extremely difficult to determine the question of cause in an educational study of this type. The number of factors which may have determined cause is large. These may include teacher variables such as their qualifications and their ability to teach; length and type of experiences; ability level of the students and their motivations--as examples.

As a result of these considerations the question as to whether PIC are superior to the SSC for this type of student may not have been proven conclusively. However, according to the results of this study it would appear that low-achievers of the type that took part in this study appear to profit academically from



the stimulation of being in a regular classroom at least on a part time basis. If this is, in fact, a correct assumption the many special segregated classes as they now exist for this type of student should be given a reappraisal.

It should also be noted that several interesting developments occurred over the course of the study. Firstly, after five months it was found that the experimental group had made significantly greater gains on all of the achievement variables except arithmetic computations. However, at the conclusion of the study there were no significant differences between the two groups in Arithmetic Computations, Arithmetic Applications, Arithmetic Mean and the Grand Battery Mean. In other words, it appeared that the partially integrated class group was slowing down in its achievement gains during the second five months of the study.

The findings of this study give partial support to the study conducted by Thurstone (1959). Thurstone compared academic achievement of educable mentally retarded (EMR) children enrolled in regular and SSC. Also using the Stanford Achievement Test, she found that the regular class retardates had significantly higher achievement scores than the special class children in all areas except arithmetic computation after one academic year. The same results were obtained in this study after the five month testing. The Thurstone study also found that



after two years there were no significant differences between the gain scores for regular and special class children. Likewise in this study there appeared to be a decline in the rate of progress for the experimental group and a corresponding increase in rate of progress for the control group at the conclusion of the study.

Thus, the results of this study have prompted several questions. Would there be any significant differences between the experimental and control groups if the study was carried on for another year? Would the SSC group make significantly greater achievement gains if the study was carried out over a period of at least four years as was the case in the Goldstein et al. (1965) study?

This study also partially supported the Carrol (1968) study which compared EMR children in partially integrated classes with EMR children in segregated classes. She found that the partially integrated group did significantly better in the area of reading after one academic year.

At the conclusion of the study the teachers of the partially integrated classes were asked to express opinions regarding the effectiveness of the program. First, they felt that there was more active participation on the part of their students in the general affairs of the school than had been the case when they taught





in specially segregated classes in former years..

Second, the attitude amongst regular classroom teachers that they are not responsible for educating these children was largely overcome. The partially integrated program became part and parcel of the junior high school program making these students the responsibility of other junior high school teachers rather than just the responsibility of the SSC teacher. Third, and perhaps most important of all, the morale of the partially integrated low-achievers appeared to be higher since the stigma of belonging to a specially segregated classroom was removed. It was the expressed opinion of these teachers that this type of program be continued and developed further.

#### Recommendations for Further Study

1. It is possible that SSC are more effective with children at some of the levels of intelligence than at others. For example, a group of low-achievers might be divided into three groups: children with IQs between 59 to 74; children with IQs between 75 to 90; and children with IQs between 91 to 106.

2. It is possible that partially integrated classes may be more effective with some age groups than with others. Comparisons might be made for several age groups.

3. A study should be done assessing a child's





status and improvement in a personality dimension in the partially integrated setting, e.g., self concept, level of maturity, attitudes, work habits.

4. A similar study of this nature should be done with a larger sample with the subjects and teachers randomly assigned to the experimental and control groups.

5. A similar study of this nature should be done over a period of several years to determine any longitudinal effects of partially integrated classes versus special segregated classes.

6. A similar study of this nature should be done taking into account the teacher variable and its influence on the results.



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